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ABSTRACT

More than 1,325 students from 34 secondary schools have participated in the University of North Carolina Mathematics and Science Network's MSEN Pre-College Program. By September 1990, more than 1,840 students from 48 schools will be involved. This program is aimed at increasing the academic preparation of minority and female students in mathematics and science at the middle grade and high school levels, and increasing the number of students who pursue science and mathematics based fields of study at the university level. It is hoped that these students then move into careers in science, technology, engineering, and teaching. The program includes a combination of academic enrichment activities built into each student's core curriculum, as well as extracurricular activities. This document contains an overview of the program, a list of the organizations in the network, a discussion of funding, a list of school benefits, a suggested outline for the core curriculum, program highlights, evaluation data, and a directory of program coordinators and faculty sponsors. (CW)

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UNIVERSITY OF NORTH CAROLINA
MATHEMATICS AND SCIENCE
EDUCATION NETWORK

MSEN PRE-COLLEGE PROGRAM

STATUS REPORT

September, 1989

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UNIVERSITY OF NORTH CAROLINA
MATHEMATICS AND SCIENCE
EDUCATION NETWORK

MSEN PRE-COLLEGE PROGRAM

STATUS REPORT

September, 1989

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MSEN Pre-College Programs

UNC MATHEMATICS AND SCIENCE EDUCATION NETWORK
MSEN PRE-COLLEGE PROGRAM
HIGHLIGHTS
(1986-1989)

* **Goal** of increasing the number of underrepresented minority students who pursue math- or science-based fields of study at the university level by providing them with rigorous **ACADEMIC ENRICHMENT activities sixth through twelfth grades.**

* Currently operating at **six MSEN Network Center sites** throughout the State with **1,330 students, as of August 31, 1989.**

* **MSEN Summer Scholars Programs** (5 week courses; **703 students** in summer, 1989; held on a university campus) and **MSEN Saturday Academy Programs** (12-18 Saturdays per academic year; **792 students**; held on a university campus) have been held at all MSEN Pre-College Program sites.

* **MSEN Academic Enrichment Class**, an elective class, held daily at each junior high/middle school involved in the Program.

* **Teacher training** workshops for **214 teachers** have been conducted from April, 1987 through May, 1989 (including 10 days during summer, 1987) for a total of 45 days. It is projected that the teacher training workshops and monthly teacher planning sessions from February through March, 1990, **will involve 247 teachers.**

* **Parental involvement** in Program activities has been enthusiastic and parent involvement clubs are operating at each involved school. Several "Family Math" and "Math Manipulatives" workshops have been offered. Parents are urging school administrators to participate in the Program at numerous sites where the Program is not yet offered.

* **Materials developed** and/or revised include a MSEN Pre-College Program Coordinator's Manual, Teacher TEAM Manual, Student Handbook, Student Assignment Book, Brochure, Data Collection Forms and an AEC Teacher Activities Guide (First Edition).

* **Two year evaluation** of Program completed, 1987-89.
  -CTBS Pre- and Post-testing of participating students show excellent gains in the five subtests in Mathematics, Language Arts and Science administered.
  -CAT scores from participating students show significant gains in Mathematics and Language Arts.

* **Funding** for the Program has been secured from a wide range of public and private sources since 1986:
  - Carnegie Corporation
  - National Action Council for Minorities in Engineering (NACME)
  - North Carolina General Assembly
  - National Science Foundation (NSF)
  - UNC Systemwide Institutions
  - Title II Collaborative Funds
  - Z. Smith Reynolds Foundation
  - Southeastern Educational Improvement Lab (SEIL)

* **The MSEN Pre-College Program, a second generation pre-college program, is recognized NATIONALLY as a highly successful model for providing academic enrichment activities for underrepresented students and inservice training for participating teachers.**

UNC MATHEMATICS AND SCIENCE EDUCATION NETWORK
MSEN PRE-COLLEGE PROGRAM

SUMMARY
(September 10, 1989)

More than **1,325 students** from **34 schools** (23 MS/JHS and 16 HS) currently participate in the University of North Carolina Mathematics and Science Education Network's **MSEN Pre-College Program**; an additional 5 schools were added in September, 1989 which will have an estimated 125 students by October, 1989 and by September, 1990 more than **1,840 students** from **48 schools** will be involved. The Program, aimed at increasing the academic preparation of minority and female students in mathematics and science at the middle grade and high school levels, has completed three full years of operation, and the Network plans to continue expansion of the Program activities during the upcoming and future years. These first three years of activities, supported by a combination of private, State, and local funding, have been extremely successful and have paved the way for continued substantial expansion of the Program in subsequent years.

The MSEN Pre-College Program works with students in **grades 6-12**, with the ultimate goal of increasing the number of students who pursue science- or math-based fields of study at the university level and then move into careers in science, technology, engineering and teaching. This is achieved through a combination of academic enrichment activities built into each student's core curriculum, as well as through extracurricular activities (e.g. on Saturdays and during the summer) that strengthen students' academic skills, career awareness programs, teacher in-service training workshops, as well as activities that increase parental involvement in their child's academic development.

Through **support since 1986**, from the National Action Council of Minority Engineers (NACME), the Carnegie Corporation of New York, SEIL (Southeastern Educational Improvement Lab), the National Science Foundation (NSF), the State of North Carolina, Title II Collaborative Funds and the Z. Smith Reynolds Foundation, the MSEN Pre-College Program currently operates at **six sites** throughout North Carolina:

-Research Triangle Consortium at NC State (a consortium between North Carolina State University and Saint Augustine College)--physically housed at North Carolina State University in Raleigh.

-Research Triangle Consortium at UNC-CH (a consortium between the University of North Carolina at Chapel Hill, North Carolina Central University, and the North Carolina School of Science and Mathematics)--physically housed at the University of North Carolina at Chapel Hill.

-Greensboro Area Mathematics and Science Education Center (GAMSEC--a consortium between North Carolina A&T State University and the University of North Carolina at Greensboro)--physically housed at North Carolina A&T State University.

-The University of North Carolina at Charlotte (UNC-C) Mathematics and Science Education Center.

-Elizabeth City State University (ECSU)

-Fayetteville State University (FSU)

The MSEN Pre-College Program site at UNC-CH was established October 15, 1988 with the support of a three year grant of $350,000 from the Carnegie Corporation of New York and the Program site at FSU was established August 1, 1989 with support of a three year grant of $100,000 from the Z. Smith Reynolds Foundation. This report details Program accomplishments during these first three years, 1986-89.

Program Achievements:

The MSEN Pre-College Program provides students in grades 6-12 with rigorous academic enrichment activities aimed at improving their science, mathematics and communications skills. The Program also works with teachers of these students in order to increase teacher knowledge of science and mathematics and teacher awareness of the particular needs of underrepresented students. The Program has two main components:

1. **Academic Enrichment and Support for Students:**
The MSEN Pre-College Program was built on several successful pre-college programs and draws most heavily from the California MESA (Mathematics, Engineering, Science Achievement) model. Activities implemented at all Program sites over the past three years include:

-MSEN Pre-College Academic Enrichment Class (AEC), an elective class offered daily to MSEN Pre-College students at **all participating JHS/MS schools**. All MS/JHS participating students must be enrolled in this class. **Academic Enrichment Labs**--which provide hands-on, experiential learning and academic enrichment tutoring opportunities for students--are also offered at each school.

-MSEN Summer Scholars Program, three to five-week courses (100 hours minimum) in science, mathematics, communications and instrumental enrichment held on five university campuses during this past summer with 703 students participating. During 1987, 375 students participated at the Program sites.

-**MSEN Satuday Academy**, sessions are held 12-18 Saturdays during each academic year on a university campus; focusing on science, mathematics, communications and instrumental enrichment skill building activities. In the 1986-87 school year, 319 students participated and in 1987-88, 569 students attended academy classes. During the 1988-89 school year 792 students participated in MSEN Saturday Academies; a number of parents were also involved.

-**California Test of Basic Skills (CTBS)** pre-testing (October, 1987) of 569 students, post-testing (May, 1988) of 501 students, pre-testing of 785 students (October, 1988) and post-testing of 688 students (May, 1989). The fall 1988 CTBS pre-test was given to 101 sixth graders, 155 seventh graders, 303 eighth graders, 129 ninth graders, 76 tenth graders, 15 eleventh graders and 6 twelfth graders. The spring 1989 CTBS post-test was given to 103 sixth graders, 135 seventh graders, 285 eighth graders, 96 ninth graders, 57 tenth graders, 8 eleventh graders, and 4 twelfth graders. In addition, the California Achievement Test **(CAT)** is given to all North Carolina students in the public schools at the third, sixth and eighth grade levels. These diagnostic tests reveal that MSEN Pre-College Program participants have made substantial gains in their science and mathematics achievement since entering the Program. Complete details on the 1987-88 and 1988-89 test results are discussed in the Evaluation Findings section of this report.

-**Parental Involvement** has been established, including the institution of Parents Involved for Excellence **(PIE) Clubs**, at each participating school. A number of "Family Math" and "Math Manipulatives" workshops have been offered at each Program site. Parents have expressed strong support for expansion to schools not yet involved with the MSEN Pre-College Program. Parents have also been very supportive with fund-raising and are committed to the goals of the Program.

-**Academic, College and Career Advising** is ongoing at each of the participating schools. This aspect of the Program is especially vital to student enrollment decisions, and significant steps have been taken to reduce the heretofore common practice of assigning mid-level but high potential minority and female students to non-college bound course tracks, even at the middle grade level. The Program also gives encouragement and support to minority and female students currently enrolled in college-bound courses.

-**Mathematics/Science Competitions**, including efforts to encourage minority and female student participation in local, regional and statewide science and mathematics fairs and contests is strongly supported. For example, the Network sponsors the annual **MSEN Pre-College Day** in the Spring of each year. The first MSEN Pre-College Day was

held in May, 1988 at N.C. State University, and 420 students from all Program sites participated in science, math and design competitions. The second MSEN Pre-College Day was held April 29, 1989 at UNC-Charlotte and over 520 students from all Program sites participated in science, math and design competitions, a public speaking contest, and a talent show. The third MSEN Pre-College Day will be held in Spring, 1990 at NC A & T State University. For many, these competitions were their first experiences in such extracurricular programs.

-**Recognition Awards Programs** are offered to students and teachers who receive commendations and awards for their participation and successes in the MSEN Pre-College Program. Recognizing student participation and successes annually is a vital part of the effort to foster high levels of self-esteem among participants.

2. **Teacher InService Training:** This component focuses on providing MSEN Pre-College Program teachers access to academic enrichment materials and information that encourage minority and female students to enroll in science and mathematics courses. To date 214 teachers have completed 45 days of in-service training, including CDA (Curriculum Development Associates) Mathematics,Communication Skills, Science and Instrumental Enrichment Skills workshops conducted from April, 1987 through May, 1989. Another eight teachers participated in a Southeastern Consortium for Minorities in Engineering (SECME) and MSEN Summer Technological Institute during the summer 1987. Six MSEN Pre-College Program teachers completed a five-day EQUALS workshop during August, 1988; EQUALS is a highly-acclaimed national program addressing the problems of under-representation of females in mathematics and science. Seven MSEN Pre-College teachers also completed a three-day Family Math workshop during November, 1988. Family Math evolved out of the EQUALS program and trains teachers to conduct Family Math inservice workshops for other teachers and parents so that they, in turn, can help their children with mathematics and problem solving. Each of these teacher inservice programs has a proven track record in working with teachers to improve their students' enrollment and academic performance in science and mathematics. The inservice training component of the Program will even be significantly expanded in subsequent years.

Teacher training workshops in mathematics, communication skills, Instrumental Enrichment, science, EQUALS and Family Math are scheduled for 247 through March, 1990. In addition, **teacher planning sessions** have been **increased** from bimonthly to monthly.

At the Program management level, the MSEN Pre-College Program Statewide Advisory Board was appointed during 1987-88 and held its first meeting in Chapel Hill on May 9, 1988. This Board provides overall guidance to the Network as the Program continues and expands.

In addition, the Network developed and/or revised the following publications during 1988/89.

- MSEN Pre-College Program Coordinator's Manual
- Teacher TEAM Manual
- Student Handbook
- Student Assignment Book
- Data Collection Forms
- Brochure
- AEC Teacher Activities Guide (First Edition)

In order to augment the Academic Enrichment Class (AEC) Core Curricula, an **AEC Curricula Guide Committee** was formed in January, 1989. This **Committee** is composed of eleven MSEN Pre-College Program LEAD Teachers, one counselor, one curriculum specialist and the MSEN Statewide Associate Director for MSEN Pre-College Programs. All of the MSEN LEAD Teachers on this **Committee** were selected based on their classroom experiences, their excellent teaching skills in MSEN Pre-College AEC classes, their committment to the goals of the Program, and their outstanding overall teaching abilities.

This **Committee** met in June, 1989 and co-authored a 211 page **AEC Teacher Activities Guide (First Edition)** as a beginning resource of activities for MSEN LEAD Teachers of each AEC class (at all participating MS/JH schools) and as a "first step" toward a forthcoming in-depth AEC Curricula Guide in two years. Each year, AEC LEAD Teachers will provide additional activities/lesson plans for inclusion in this **Guide.** The suggested activities and lesson plans cover science, mathematics, communication, and awareness discipline areas. In addition, the **Guide** includes an "Interdisciplinary Unit on Acid Rain," a "Skills Chart" for each discipline unit, an AEC "Sample" Nine-week Schedule and an Annotated Resources List. A copy of the **AEC Teacher Activities Guide (First Edition)** was made available to each MSEN Academic Enrichment Class LEAD Teacher throughout North Carolina September 1, 1989. A sheet listing the co-authors of this **Guide** is found in the Appendix (Supplementary Program Information).

Program Activities:

All components/activities for the MSEN Pre-College Program--Academic Enrichment Classes, MSEN Saturday Academies, MSEN Summer Scholars Programs, even the mathematics and science competitions--are academically intensive, challenging and enriching supplements to regular school-year courses. These rigorous Program academic courses enable students to: improve and refine their knowledge, problem-solving and analytical skills with individual and group instruction from university faculty members and master public school teachers; participate in laboratory and field work; interact with business scientists and engineers; and participate in team approaches to learning (i.e., cooperative learning techniques). In other words, the Program's

courses enable students to gain enrichment experiences in the fields of science and mathematics that generally are not available in North Carolina's public schools. Most significantly, all these Program enrichment activities take the basic principles that students learn during the academic year and apply them to the type of science and mathematics problems students will face in college and during their careers. The hands-on, experiential learning process and the application to "real-life" science and mathematics problems, including the project-oriented approach, are what set the MSEN Pre-College Program enrichment activities apart from regular school activities.

For example, each MSEN Summer Scholars Program meets for three to five weeks (minimum of 100 hours) during the summer on a university campus, with courses taught by a university faculty member and a master teacher from the local public school system. Courses for the MSEN Summer Scholars Program include the following at each site:

A. **Mathematics:** Topics for junior-high students include problem-solving and application of the following mathematical concepts: verbal problems, prime factors, and linear equations. Topics for senior-high students include higher order mathematics concepts in geometry, trigonometry, and pre-calculus classes. The aim is to provide problem-solving experiences for students in these particular areas, and to present mathematical concepts in a way that demonstrates the excitement and innovation of mathematics, particularly at the college level and in the course of one's career. The final two weeks also include computer programming techniques.

B. **English/Communication skills:** Students are required to develop a research project on a scientific issue of contemporary relevance in society, such as waste management, molecular biology, AIDS, etc. The level of sophistication of each project is commensurate with the grade level of each student. Students are also required to: a) complete a written research paper, and b) deliver the results of their research to the class in an oral presentation during the final week of class. Students receive instruction from a Language Arts/English teacher, with the focus on building skills in concentration, increasing vocabulary, word attack via root words, literal and interpretive comprehension, conducting an interview, participating in a debate, writing poetry, and participating in extemporaneous skits.

C. **Science Projects:** Students receive instruction on and view examples of laboratory experiments that increase awareness of the basic experimental techniques used in chemistry, physics and biology courses. The emphasis is on the application of science to problems that university and business scientists face on a daily basis. Each student engages in his/her own projects with individual assistance and support from the university

faculty instructor. The final two weeks of this course involves the application of computers to solving scientific problems.

D. **Instrumental Enrichment:** Instrumental Enrichment is a curriculum intervention for the development of higher order thinking and learning skills, based on Rueben Feuerstein's work. It provides problem-solving tasks, strategies for individual mediation, and discussions for insight to enrich cognitive functions. The aim is to foster the development of skills that stimulate the student to independently engage in scientific inquiry and increase his/her analytical skills.

In addition to the regular MSEN Summer Scholars Program instruction, students interact frequently with members of the scientific community through field trips, guest presentations by practicing scientists and engineers, and science competitions.

UNC MATHEMATICS AND SCIENCE EDUCATION NETWORK

MSEN PRE-COLLEGE PROGRAM

ACTIVITIES OUTLINE

Schools Participating in Program	JHS	MS	HS
1. **Research Triangle Consortium:**			
RTC-NC State:			
Ligon Middle		X	
Carnage Middle		X	
Wake Forest/Rolesville		X	
Enloe High			X
Athens Drive High			X
(Additional schools in Wake, Warren & Vance Counties = Oct/Dec, 1989)			
RTC-CH:			
Holton Middle		X	
Shepard Middle		X	
Hillside High			X
Chewning Middle		X	
Lowe's Grove Middle		X	
Githens Middle		X	
Bragtown (6th)		X	
Jordan High			X
Grey Culbreth Jr. High	X		
Phillips Jr. High	X		
Chapel Hill High			X
2. **Greensboro:**			
Northeast Middle		X	
Griffin Middle		X	
Kiser Middle		X	
Aycock Middle		X	
Ferndale Middle		X	
T. W. Andrews High			X
High Point Central High			X
Page High			X
Grimsley High			X
3. **Charlotte:**			
Anson County Jr. High	X		
Cochrane Jr. High	X		
N.W. Cabarrus High			X
Ranson Jr. High	X		

	JHS	MS	HS
Concord High			X
A. L. Brown High			X
Eastway Jr. High	X		
Northwest Middle		X	

4. **Elizabeth City:**

Gates County High			X
Northeastern High			X
Perquimans High			X
John A. Holmes High			X
Elizabeth City Jr. High	X		
H. L. Trigg (6th)		X	
TOTAL SCHOOLS: 39	7	16	16

(9/89)

STUDENT ENROLLMENT:

RTC-NC:	156	(6-11)
RTC-CH:	511	(6-11)
GAMSEC:	232	(7-11)
UNC-C:	269	(7-11)
ECSU:	162	(8-11)
	1,330	

*The above figures represent student enrollment as of August 31, 1989. Student enrollments are continuing to be received.

MSEN TEACHER/ADVISOR TEAM:

Activities in each school are coordinated by a teacher/advisor TEAM:

Number	Categories
29	Math Teachers
23	Science Teachers
16	Language Arts or other teacher staff
22	Other school personnel (Counselors)
2	Other staff (Assistant Principal)
92	Total

PROGRAM ACTIVITIES:

	Frequency
MSEN Academic Enrichment Class (entire school year)	Daily
MSEN Saturday Academy (12-18 Saturdays at a university campus)	Weekly
MSEN Summer Scholars Program (100 hours at a university campus)	Daily
MSEN Student Clubs	Weekly
Field Trips (1 per semester; 1 per MSEN Saturday Academy; 1 per MSEN Summer Program)	N/A
End-of-Year Awards Banquet (May or June)	Annually
MSEN Pre-College Day (April/May)	Annually
PIE (Parents Involved for Excellence) Clubs	Monthly
MSEN Lead Teacher Planning Sessions	Monthly
MSEN Lead Teacher training (CDA Math, Comm. Skills, I.E., etc)	12 days/yr

Funding

The Program is supported with a combination of State, local and private funding. The North Carolina General Assembly appropriated $250,000 for the first year (1986-87), $303,000 for the second year (1987-88), and $628,000 for the third year (1988-89) to extend the Program to high school. Carnegie Corporation of New York provided a two year (1986-1988) $250,000 grant and a three year (1988-1991) grant of $350,000 to establish the fifth Program site at UNC-CH. The National Action Council for Minorities in Engineering (NACME) has provided a total of $66,500 over two years; NSF provided a $128,762 grant for the 1988 Young Scholars Program and $154,000 grant for the 1989 Young Scholars Program; the Z. Smith Reynolds Foundation provided a $100,000 grant for three years (1989-1991) to establish a sixth Program site at Fayetteville State University; and more than $40,000 has been contributed by several universities in the UNC System. In addition, local school systems are providing support in the form of buses used to transport students, substitute teacher pay and release time/honoraria for TEAM teachers, and other contributions to the Program. The cost of the MSEN Pre-College Program is approximately $500 per student per year for the year-round and multi-year Program.

UNC MATHEMATICS AND SCIENCE EDUCATION NETWORK
MSEN PRE-COLLEGE PROGRAM

Program BENEFITS for School

- Improve home/school relations
- Improve students' self-esteem and leadership skills
- Increase student pride in the school environment
- Increase teacher expectations of participating students
- Increase school attendance of underachieving students
- Increase participation of historically underrepresented students in mathematics and science contest/competitions/ projects (local, regional, and statewide)
- Increase student exposure to outstanding role models and rewarding future careers
- Enhance academic, college, and career advising
- Increase the enrollment of historically underrepresneted students from general education (mid-track) mathematics courses into college-preparatory advanced/honors mathematics, Algebra I/Geometry and academic-level science courses
- Increase support for high achieving historically underrepresented students in college-preparatory advanced/honors mathematics & science courses
- Increase mathematics and science teacher involvement in training seminars and with development of relevant curricula
- Positive image of school and enhancement of leadership role in the community
- Obtain multi-year commitments and additional resources for underachieving students

MSEN Pre-College Program

ACADEMIC ENRICHMENT CLASS
(Suggested "Core" Outline)

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
MATH:	**ACADEMIC ENRICHMENT LAB:** (Math or Science Enrichment Tutoring)	**SCIENCE:**	**ENGLISH:** .Instrumental Enrichment Activities	**CAREER AWARENESS** .Reading
.CDA Math Activities	.Individual and Group/ Team Academic Labs	.Enrichment of school's Science Activities	.Writing Reports	.Role Model Speakers
.Pre-Algebra/ Algebra/ Geometry activities .Analytical skills	.Tutors from university/ college, business, peer (H.S.) community, professional organizations	.Hands-on experiments (COMETS, TOPS, FAST, etc.)	.Oral and written communication skills (based on CDA training)	.Field Trips (local)
.Problem Solving skills	.Study Sessions (Team/Group; Individual)	.Projects/ Competitions (Science Fair Projects)	.Motivation activities	.Leader-ship activ-ities*
.Effective Mathematics Activities		.Note/test-taking skills	.Self-esteem Activities	.Academic, Career & College Advising
.Engineering Design Contests (e.g., bridge building)				.Counsel-ing

*Please note that student LEADERSHIP SKILLS are also developed through the **MSEN Academic Chapters for Excellence Student Club Meetings** after school or during student activity periods and the annual 3-day **MSEN Pre-College Student Leadership Retreat** for student club officers.

Other Program Highlights

The MSEN Pre-College Program student clubs are called Academic Chapter for Excellence or **ACE Clubs.** Each participating school in the Program has an ACE Club which serves as a peer support group for students and offers leadership experiences. A few examples of ACE Club activities throughout the 1988-89 school year are itemized below:

-Adopted local elementary school students and hosted both school-related and social activities for them.
-Volunteer efforts, such as: tutoring, purchasing and delivering gifts to local nursing homes, purchasing and delivering holiday dinners to families recommended by social services, cleaning school grounds of litter, and contributions of refreshments for "Teacher Appreciation Day".
-Development and performance of skits (e.g., "Just Say No To Drugs" and Martin Luther King Day).

Each school involved with the MSEN Pre-College Program has a Parents Involved for Excellence or **PIE Club.** This Club allows parents of Program students to meet monthly and give support/encouragement to their sons and daughters. Not only are "Family Math" and "Math Manipulatives" workshops offered to them but also any assistance, based on their needs, they may need to help their children in a pursuit of academic excellence. Some examples of 1988-89 workshops given for parents are listed below:

-Scholarships for teaching in North Carolina
-Active parenting
-Where There's A Will, There's An A
-Women and minorities in science
-Developing positive self images and discipline in Black children.
-Opportunities in the medical professions.

In addition to intensive teacher training and monthly teacher planning sessions, there are several **professional growth activities** for teachers which were offered during the 1988-89 school year and summer. Some of these activities are related below:

-Learning patterns, cross-cultural implications and strategies.
-Understanding the developmental stages and problems of middle school children.
-Instilling positive images and self-discipline in Black children.
-Using the computer as an instructional tool in the classroom.

Examples of Program Impact

In the three years since the implementation of the Program, more than 1,330 students from 34 junior/middle and senior high schools have participated in the MSEN Pre-College Program. The following are brief examples of the impact of the Program on participating students, parents and schools:

1. Four 8th grade students represented the statewide MSEN Pre-College Program at the National Association of Precollege Directors (NAPD) "Model Seminar on Promoting Success in Precollege Mathematics and Science" held for 150 southeastern regional teachers, principals and university administrators in Atlanta, Georgia on December 12 & 13,1988. The MSEN Pre-College Program was one of five precollege programs participating and the MSEN students presented four separate workshops on "Pascal's Triangle and the Laws of Heredity." The MSEN students were definitely the "stars" of the seminar and attendees commented that they were astounded with the students' poise and knowledge of algebraic concepts.

2. After only one to two years of involvement with the MSEN Pre-College Program, 18 participating schools have elected to offer an MSEN Academic Enrichment Class (AEC), at their own expense, in addition to the MSEN Academic Enrichment Class offered by the MSEN Pre-College Program. This enables the MSEN Pre-College Program to serve an even higher number of students.

3. Prior to involvement with the MSEN Pre-College Program, two middle schools in one county only offered classes in basic mathematics. After one semester's involvement with the Program, the school board approved course offerings of Pre-Algebra and Algebra I in each school so that MSEN Pre-College Program students--as well as other students--could enroll in the proper college-prep sequence in mathematics.

4. Several MSEN Pre-College Program students have won first, second and third place in science competitions/projects and in math/design contests during April of 1989. None of these students had ever entered these types of academic competitions previously.

5. Parents are invited to attend each MSEN Saturday Academy session (12-18 Saturdays on a university campus), especially the first and last Saturday of each session. Several parents decided to attend each MSEN Saturday Academy session with their sons/daughters and subsequently requested that they receive a foundation course in physical science (including some basic chemistry) to enable them to assist their children in studying science. A foundation course in physical science for parents was taught during each Saturday session. In addition, Family Math & Math Manipulative courses have been offerred to parents on Saturdays and during some evening sessions.

6. Because of their participation in the MSEN Summer Scholar Program, MSEN Academic Enrichment Class, and MSEN Saturday Academy, all 19 eighth grade MSEN Pre-College Program students in one middle school enrolled in Algebra I, Advanced Algebra or Geometry in Fall 1988.

7. Because of her daughter's participation as an MSEN Pre-College Program student, a mother was stimulated to enroll in a community college to meet the requirements necessary for enrollment in a university nursing program. In January of 1988 this parent was able to enroll in a nursing program on a UNC campus.

8. An 8th grade MSEN Pre-College student increased his academic grades from C's, D's and F's during the first and second grading periods in Fall, 1987 to all A's and B's during the third grading period in Spring 1988 because of his participation in the MSEN Academic Enrichment Class and MSEN Saturday Academy. He is representative of many MSEN Pre-College Program students.

9. Because of her daughter's participation as an MSEN Pre-College Program student, a father enrolled in an Algebra I course at a community college so he could assist her with her mathematics.

10. A father of an MSEN Pre-College Program student refused a job transfer offer because he discovered that the new school his son would have to attend was not involved with the MSEN Pre-College Program. The principal of this school subsequently called the MSEN Pre-College Program office and requested that his school become involved with the Program. His school board and superintendent, after a presentation, accepted involvement, and this school became an MSEN Pre-College Program participating school for Fall 1988. The father eventually accepted the original job transfer offer.

11. Because of her increased self-esteem and confidence as an MSEN Pre-College Program participant, a student ran for her school's student body President (8th grade) and won. She had never before been involved in a leadership role.

EVALUATION FINDINGS

Evaluation Summary

The MSEN Pre-College Program has been in operation for two and one-half years. During that time student enrollment has increased to 1,330, with 34 participating schools. Demographic data were collected for 1,204 of the 1,330 MSEN Pre-College Program students whose enrollment forms were received before an August 1989 cut-off date. Course enrollment data, CAT scores, and CTBS scores were collected on those 1,069 students who participated in the Program during the 1988-89 academic year.

Almost 80 percent of MSEN Pre-College middle/junior high and high school students were enrolled in academic college-bound mathematics courses during 1988-89; over 90 percent were enrolled in academic science courses. Students showed excellent gains in reading comprehension, language expression, mathematics computation, mathematics concepts and applications, and science, as evidenced by their scores on the California Achievement Test (CAT) and the Comprehensive Test of Basic Skills (CTBS).

Principals, teachers, parents and students have been overwhelmingly positive about the effects of the Program on student confidence, self esteem, academic motivation, and skills. Overall, the Program has been extremely successful in providing an enriched curriculum for minority and female students.

Participating school enrollment data indicate that Black students continue to be underrepresented in academic track courses. As the MSEN Pre-College Program continues to grow during the next few years, it should become even more successful in meeting the mathematics and science education needs of North Carolina's minority and female students by not only providing an enriched curriculum for Program students, but also by influencing the math and science enrollment patterns of minority students in participating schools.

Demographic Data on Participants

Demographic data on 1204 of the Program's students are presented in Figures 1 through 6. The data from which these graphs were constructed were collected from original enrollment forms completed by all MSEN Pre-College students upon entrance into the Program. Because of a change in reporting format, data on parents' educational levels and occupations were reported by parents of newly-enrolled students (1988-89 academic year and summer of 1989); data on

the parents of students who enrolled in the Program prior to fall 1988 were reported by students.

The 1988-89 grade levels of MSEN Pre-College students ranged from grades six to twelve (Figure 1); the majority of students were 7th (18.6%), 8th (31.9%), or 9th (18.1%) graders during the 1988-89 school year. The group of participating students consisted of 87 percent Black, 11 percent white, and two percent students of other races (American Indian, Hispanic, and Asian American). Sixty-six percent of enrollees were female, with 34 percent male (Figure 2). The greatest number of current MSEN Pre-College students (45%) enrolled in the Program during the 1988-89 school year; ten percent were 1986-87 enrollees; 31 percent enrolled during the 1987-88 year; and 11 percent were new enrollees from the summer of 1989 (Figure 3).

Slightly over half of MSEN Pre-College Program students reported that their primary career interest was in a math- or science-based field; most frequently mentioned as specific career choices were medicine, law, engineering, and computer science. These data are shown in Figure 4.

Data on educational levels of MSEN Pre-College parents were collected on 832 fathers and 959 mothers (Figure 5). Of these 1,791 parents, 42 percent were college graduates (or higher). Occupational data were reported for 1,430 parents (Figure 6); of these, 63 percent held professional, administrative, or technical positions. The group of parents for whom educational and occupational data were unavailable may contain significantly lower percentages of college educated persons with administrative, professional, or technical occupations.

MSEN Pre-College Student Enrollment Data

In 1988-89, almost 80 percent of the 1,069 students who had completed one or more semesters in the Program were enrolled in academic college-bound classes in mathematics, with 90 percent of Program students enrolled in academic college-bound classes in science.

The MSEN Pre-College has adopted a number of indicators of Program success, or academic goals, such as student enrollment in Algebra I by the 9th grade, Academic Biology by the 10th grade, and so forth (see list on the following page). In Figure 7, the numbers of students who achieved one of the Program's indicators of success are shown. During the Program's first year of operation (1986-87), 25 students achieved one of the Program's benchmark academic goals in mathematics or science; during the second year (1987-88), the number of students reaching a Program

INDICATORS OF SUCCESS

* ALGEBRA I BY 9TH GRADE
* GEOMETRY BY 10TH GRADE
* ALGEBRA II BY 11TH GRADE
* TRIGONOMETRY BY THE 12TH GRADE
* ACADEMIC PHYSICAL SCIENCE BY 9TH GRADE
* ACADEMIC BIOLOGY BY 10TH GRADE
* ACADEMIC CHEMISTRY AND/OR PHYSICS BY 11TH/12TH GRADES
* COMPLETION OF REQUIREMENTS TO ENROLL IN COLLEGE
* ENROLLMENT IN A MATHEMATICS- OR SCIENCE-BASED COLLEGE MAJOR
* COMPLETION OF UNDERGRADUATE DEGREE IN A MATHEMATICS- OR SCIENCE-BASED FIELD

academic goal increased to 155; and during 1988-89, 564 students achieved one of the Program's enrollment goals.

In terms of percentages of students enrolled in grades 9 through 12 who met Program goals, math goals were met by 19.4 percent of 1986-87 students, 81.9 percent of 1987-88 students, and 70.8 percent of 1988-89 students. Science goals were met by 17.9 percent, 65.7 percent, and 65.4 percent of grades 9-12 students during Program years one through three, respectively. The percentages of students meeting goals increased in 1987-88 and then decreased slightly in 1988-89 because during 1987-88 few new 9th through 12th graders were enrolled in the Program; however, during 1988-89, a much larger number of new 9th and 10th graders were enrolled; new Program students at those grade levels are less likely than continuing Program students to be enrolled in benchmark academic courses.

Scores on the California Achievement Test (CAT) and the Comprehensive Test of Basic Skills (CTBS)

MSEN Pre-College students showed excellent gains as measured by the total mathematics battery of the CAT. In comparisons of scores before they had entered the Program with those after one, two, or three years in the Program, students showed significant gains in grade equivalent scores (Figures 8-10). Gains were especially great for 1988-89 8th graders, who gained an average of three grade levels in mathematics in one year.

In Figure 11 the 1989 mathematics CAT scores of MSEN Pre-College Program 6th and 8th graders are compared with North Carolina averages. Sixth graders, who were in their first MSEN Pre-College Program year during the 1989 testing, averaged a grade equivalent score of 8.6; Pre-College 8th graders, who were in their first, second, or third Program years in May 1989, averaged a grade equivalent score of 12.9. These scores were significantly higher than the average scores for all North Carolina students.

Program students were pre-tested on the CTBS in the fall of 1988 and posttested during the spring of 1989; during that one school year students in almost all grades made significant gains in the areas tested--reading comprehension, language expression, mathematics computation, mathematics concepts and applications, and science (Figures 12-17). The only exception to this scoring trend was a group of 11th graders whose reading comprehension scores dropped (Figure 17). An examination of individual scores indicated that of the six students in the group, one student's extreme drop in score (from 12.9 on the pre-test to 5.0 on the posttest) strongly influenced the group mean. This student may not have completed his/her test.

Qualitative Evaluation

During the summer of 1988, a sample of Program principals, teachers, parents, and students was surveyed to determine opinions about the MSEN Pre-College Program's impact on students, their families, and school systems. All groups found the Program to be extremely valuable. In particular, most respondents commented on the increased confidence and self-esteem of MSEN Pre-College Programs, as well as their gains in academic skills. Principals and teachers reported that the Program brought significant increases in parent participation in school activities. Parents praised the Program because of the strong academic interest and motivation it had instilled in their children.

Participating School Enrollment Data

Data on the 1988-89 mathematics enrollment patterns of all students in participating MSEN Pre-College Program schools, grades 6 through 8, are presented in Figure 18 (by number of students of each race enrolled in each mathematics class) and Figure 19 (by percentage of students of each race enrolled in each mathematics class). These graphs include data from 21 of the 34 MSEN Pre-College schools from five North Carolina sites. From both graphs it is clear that Black students were overrepresented in Basic/Remedial and General Math classes at the middle/junior high level; white students were overrepresented in Pre-algebra, Algebra I, and Advanced/Honors/GT Math classes. Almost four percent of the 5,554 Black students in these schools were not enrolled in a math class; only .6 percent of white students were not enrolled in math.

The data on 1988-89 mathematics enrollment patterns of all students in grades 9 through 12 show a similar pattern. These data (Figures 20 and 21) were collected from 21 of the 34 MSEN Pre-College schools. Black students were overrepresented in Basic/Remedial, General/Applied Math, and Introductory Algebra; white students and students of other races were overrepresented in Geometry, Algebra II, and higher level math classes. Over 15 percent of Black high school students were not enrolled in a math class (1,033 students), and an even more alarming 32 percent of students of other races were not enrolled in math at participating high schools during the 1988-89 school year.

Science class enrollment patterns for all students in grades 9-12 are presented in Figures 22 and 23. Here again Black students were overrepresented in Basic/General Science and "Applied Science" courses. White students were overrepresented in the higher level academic science

courses. Over 20 percent of Black students and almost 40 percent of students of other races were not enrolled in a science class during 1988-89.

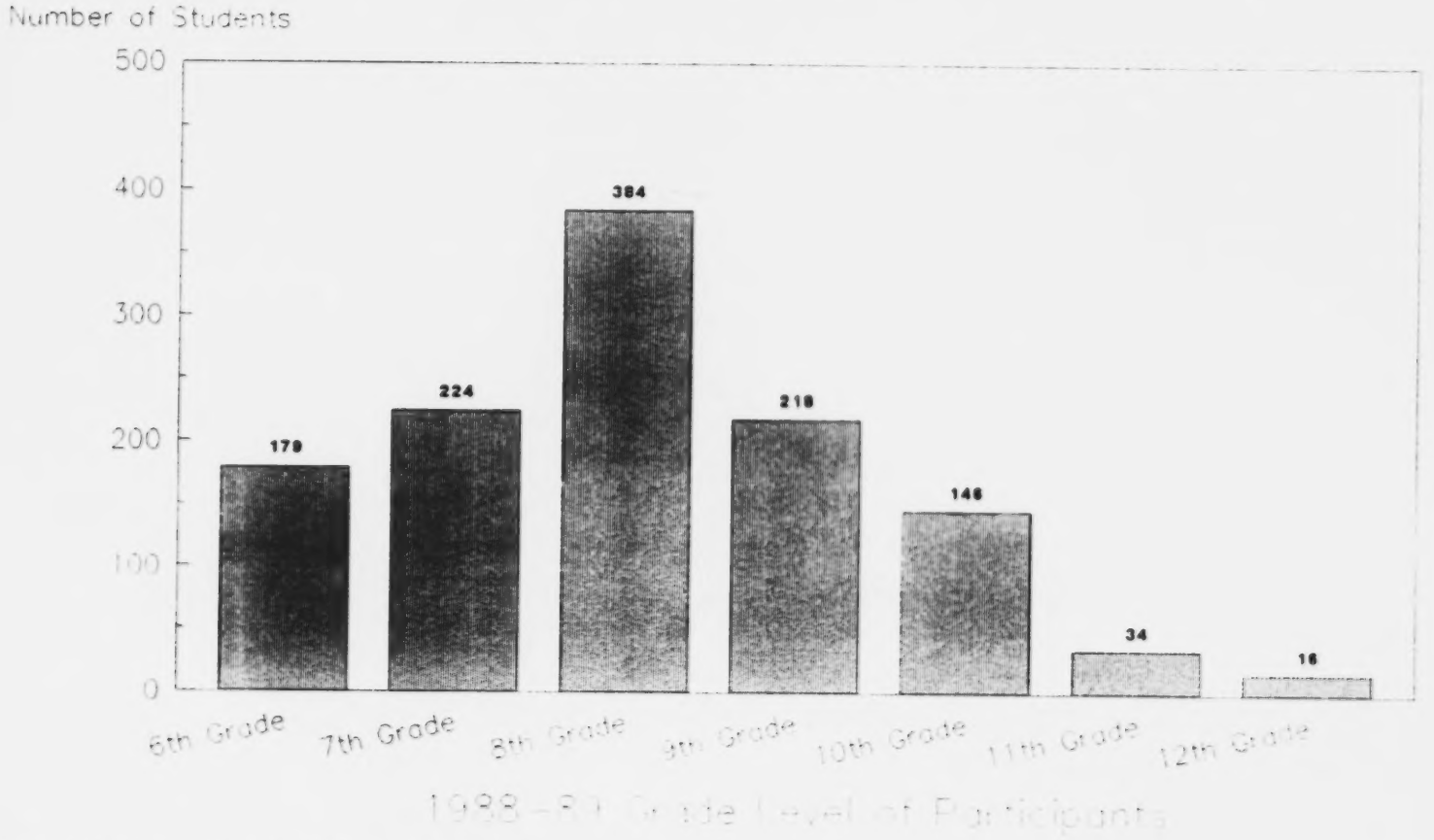
It is difficult to make valid comparisons between 1988-89 enrollment data and that collected in previous years because each year's enrollment findings were based on data from differing numbers of schools. In making gross comparisons across all of each year's participating schools, however, it appears that the percentages of Black students enrolled in advanced mathematics and science courses has not increased and may, in fact, have decreased during the last two years. A school by school analysis of enrollment patterns will be carried out later in the year to determine if changes have taken place in continuing Program schools over the three-year period.

The enrollment findings for participating schools are reflective of state and national trends. The schools in the MSEN Pre-College Program are to be commended because they are trying to remedy the situation with a Program that should increase the number of historically underrepresented minority students who enroll in academic mathematics and science courses.

MSEN PRE-COLLEGE PROGRAM

EVALUATION DATA

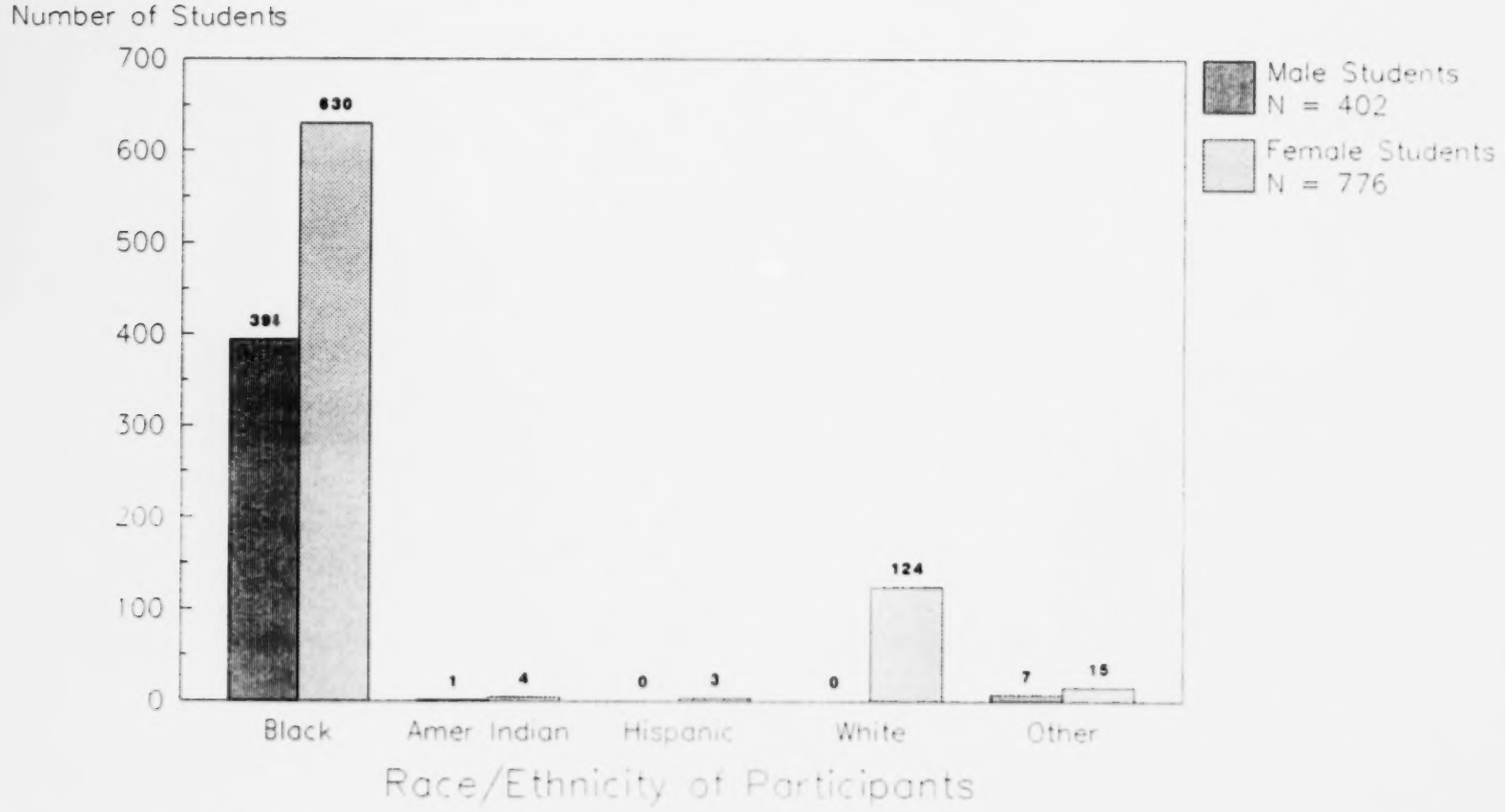
Figure 1. Grade Levels of North Carolina MSEN Pre-College Program Participants: 1988-89



1988-89 Grade Level of Participants

Total Number of Students = 1204
Data not Available for 3 Students

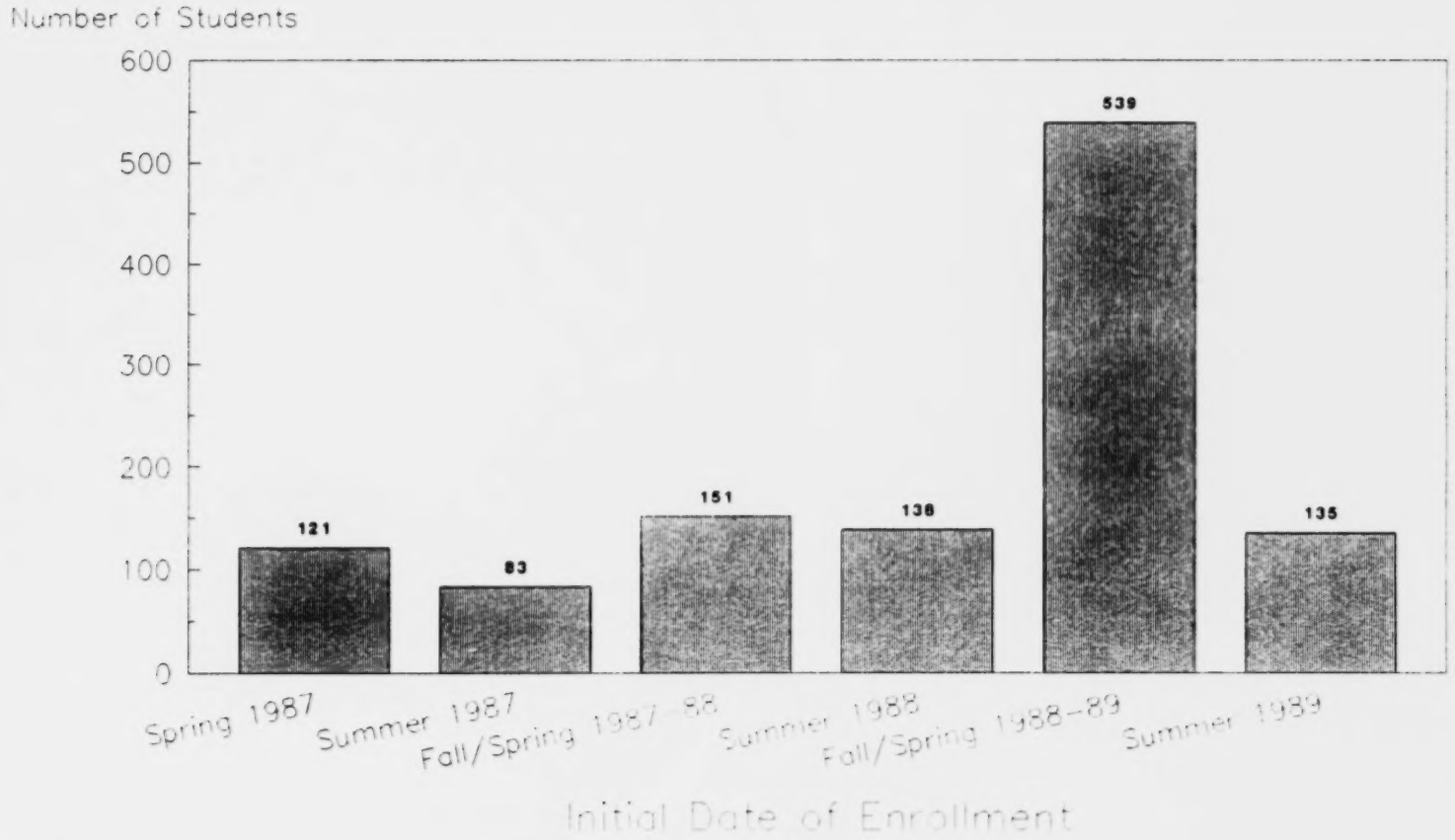
Figure 2. Gender and Race/Ethnicity of North Carolina MSEN Pre-College Program Participants: 1988-89



Total Number of Students = 1204
Data not Available for 26 Students.

8/18/89

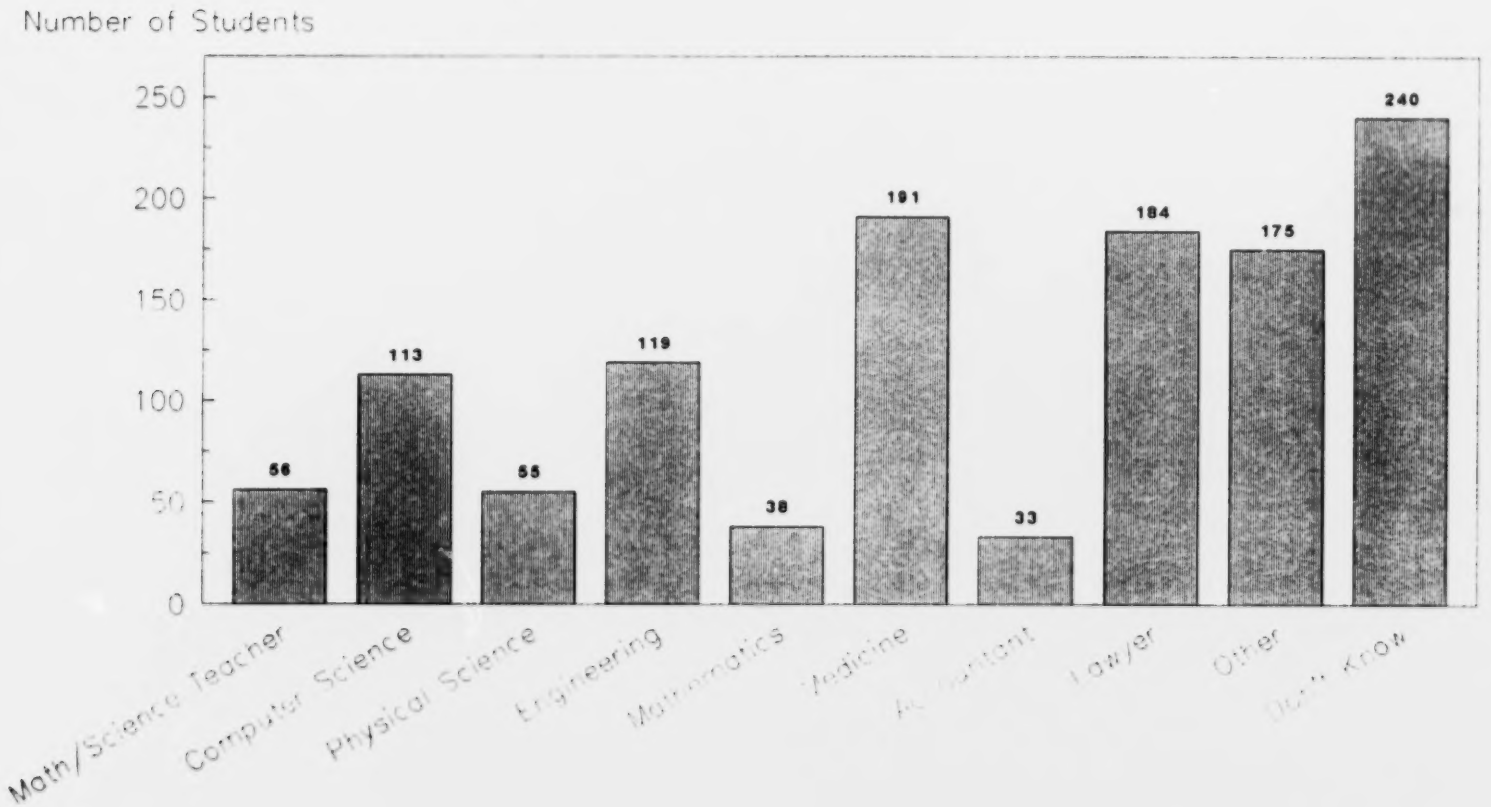
Figure 3. Initial Dates of Enrollment of North Carolina MSEN Pre-College Program Participants: 1988-89



Total Number of Students = 1204
Data not available for 37 Students.

8/18/89

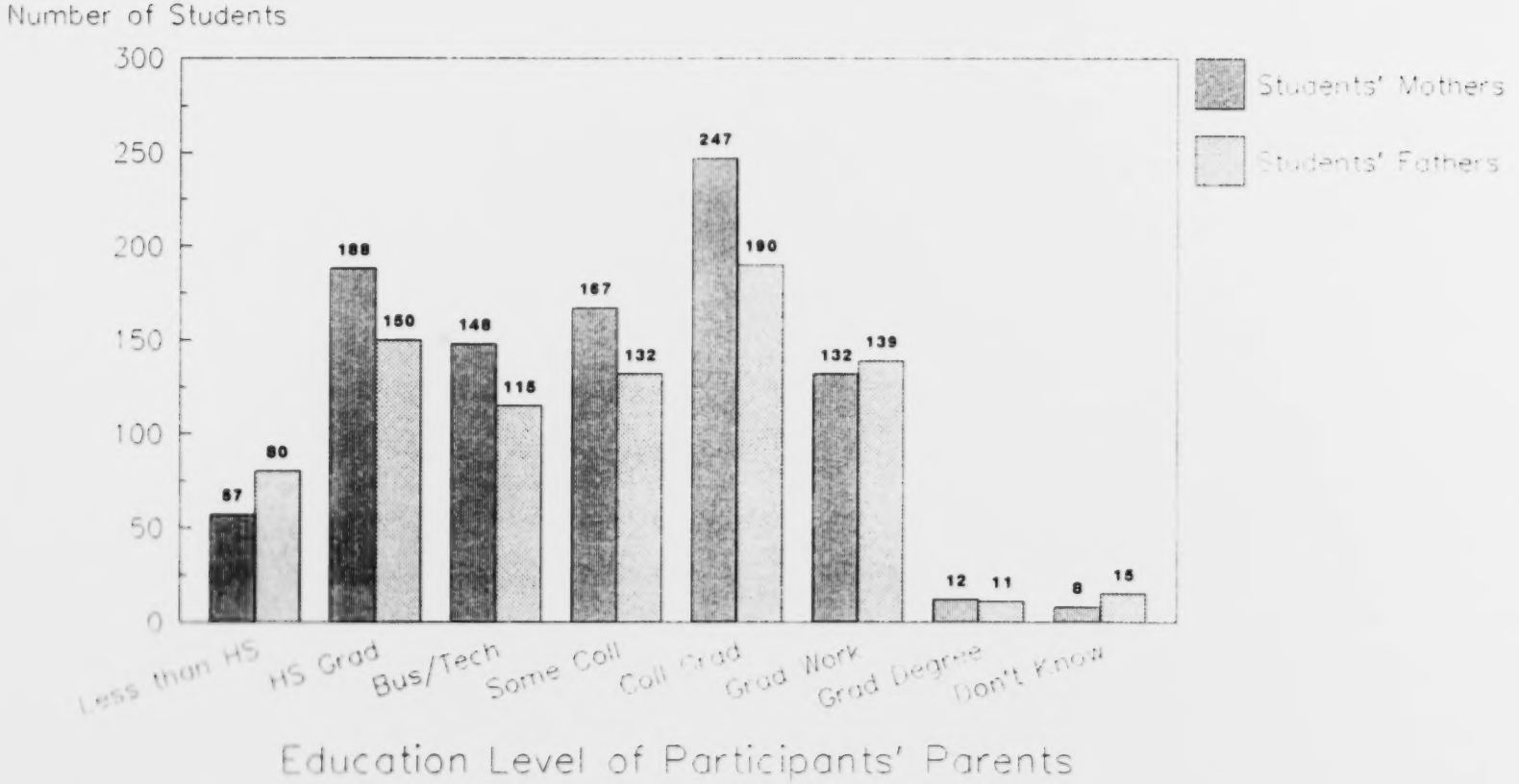
Figure 4. Primary Career Interests of North Carolina MSEN Pre-College Program Participants: 1988-89



Total Number of Students = 1204

8/18/89

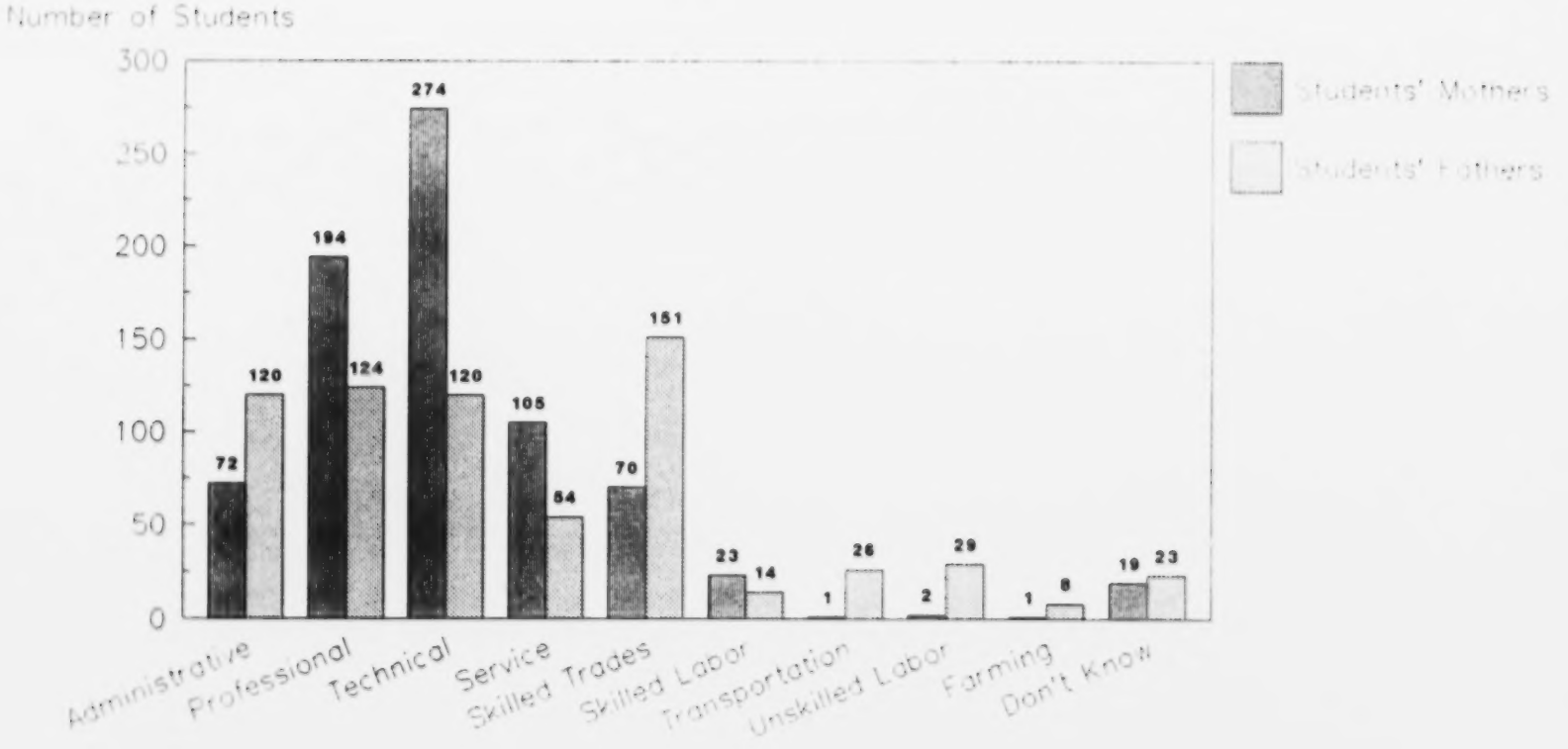
Figure 5. Educational Levels of Parents of North Carolina MSEN Pre-College Program Participants: 1988-89



Total Number of Students = 1,204
Fathers' Education Data Not Available for 372
Mothers' Education Data Not Available for 245

3/18/89

Figure 6. Occupations of Parents of North Carolina MSEN Pre-College Program Participants: 1988-89



Total Number of Students = 1204
Fathers' Occupation Data Not Available for 535
Mothers' Occupation Data Not Available for 443

8/16/89

Figure 7. Number of MSEN Pre-College Program Participants Who Reached or Exceeded Programs Goals 1986-87 - 1988-89

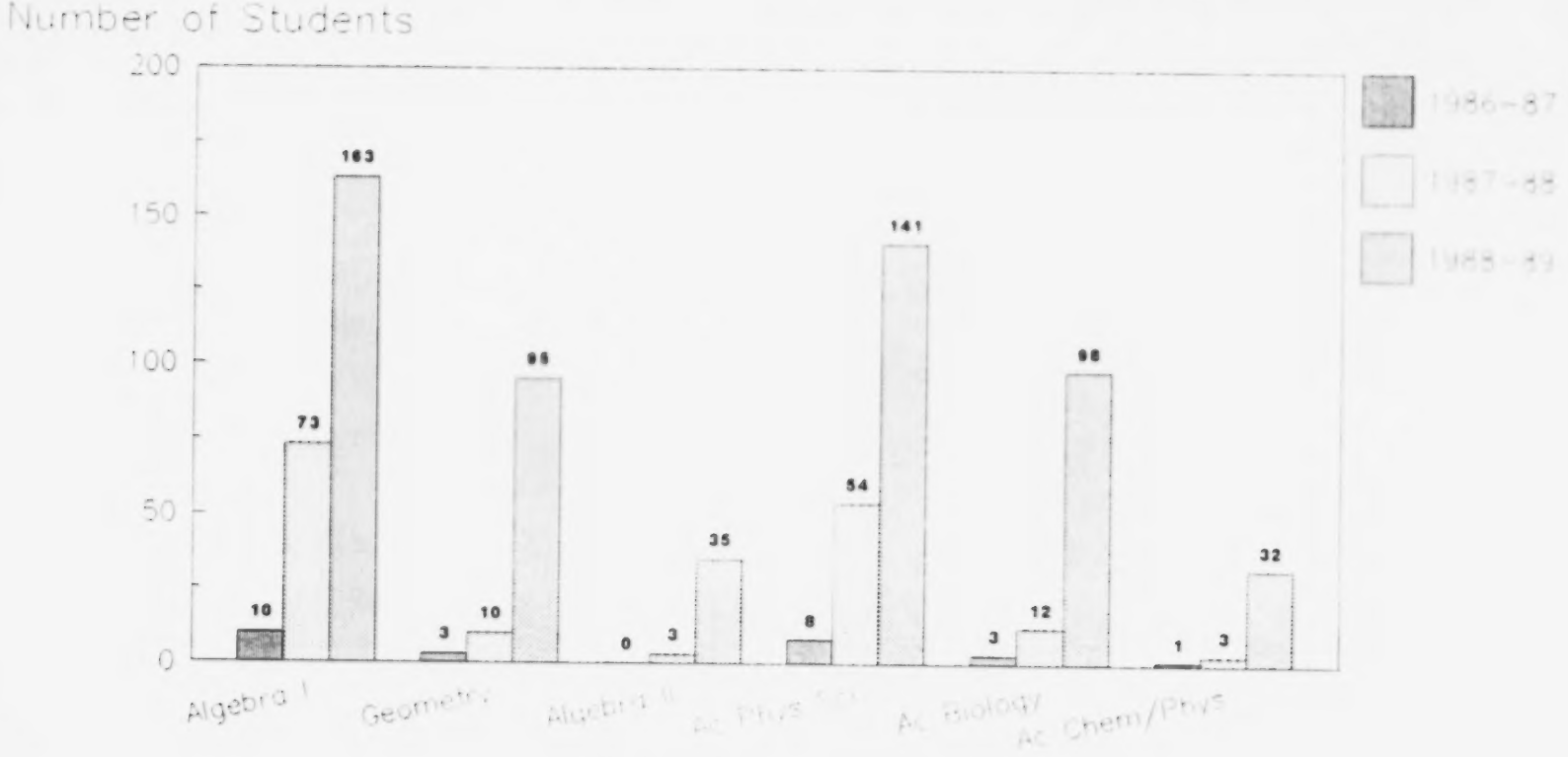
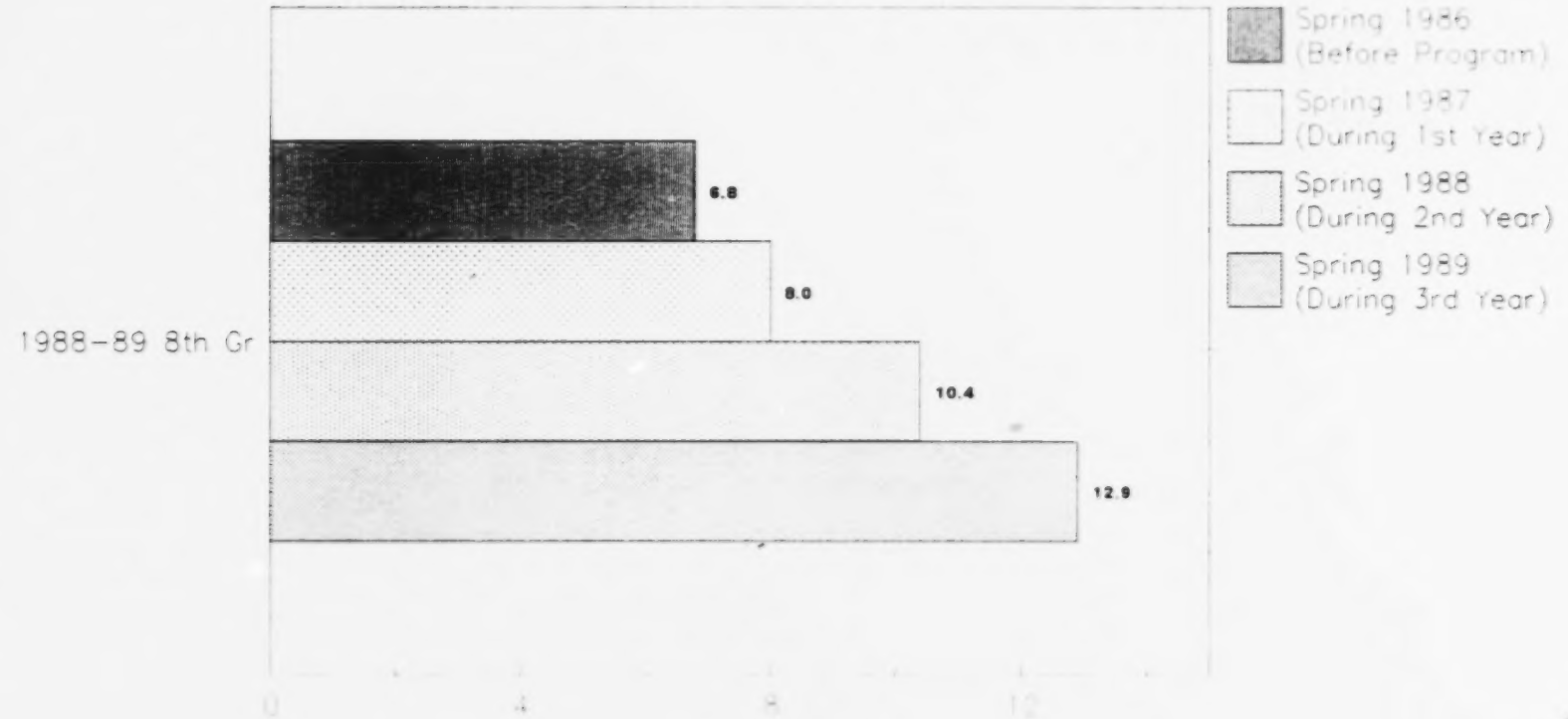


Figure 8. CAT Mathematics Scores of MSEN Pre-College Participants Who Entered the Program During the 1986-87 School Year: 1986-1989 Scores



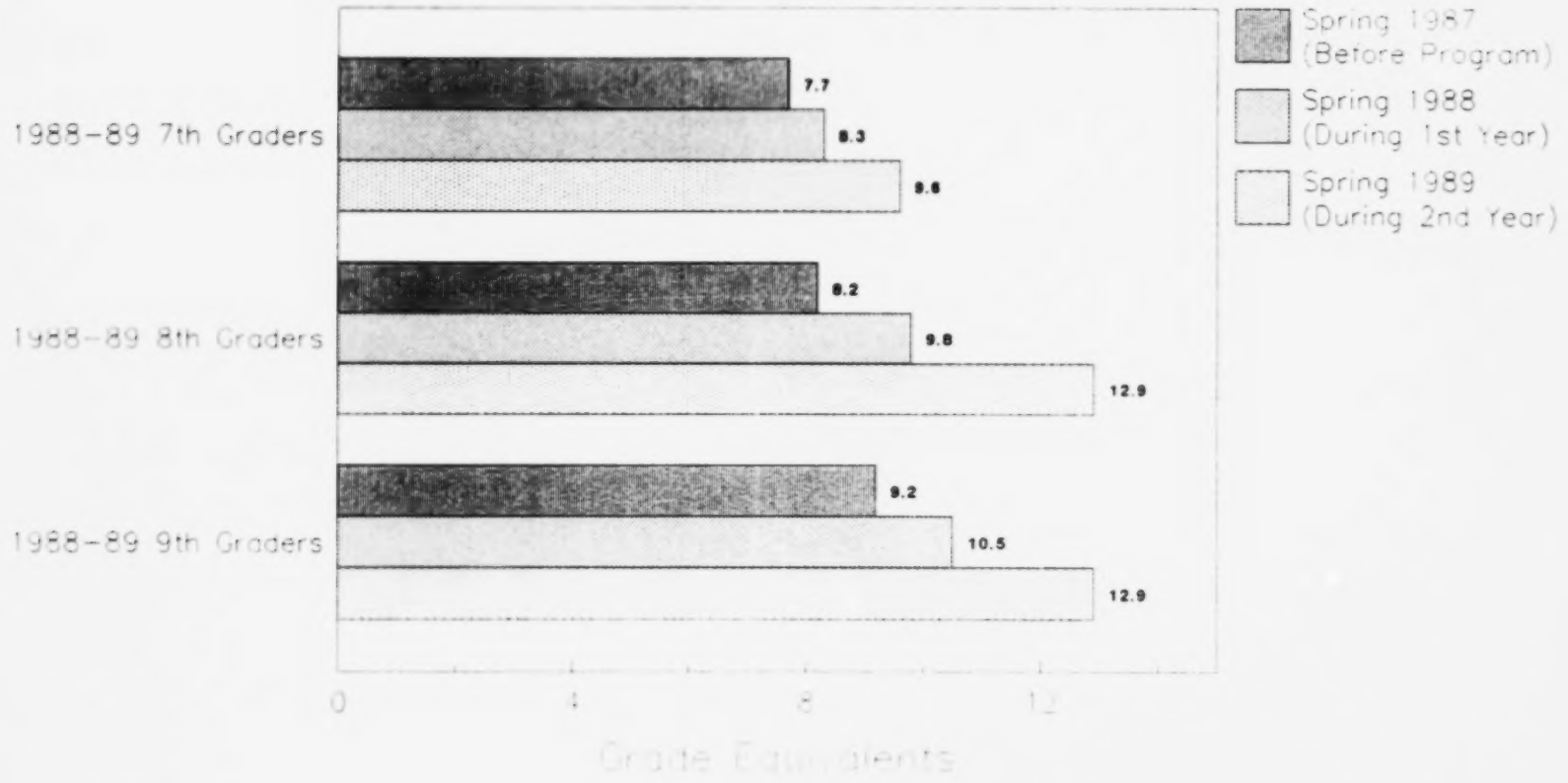
42

43

Number of Students = 57

8/16/89

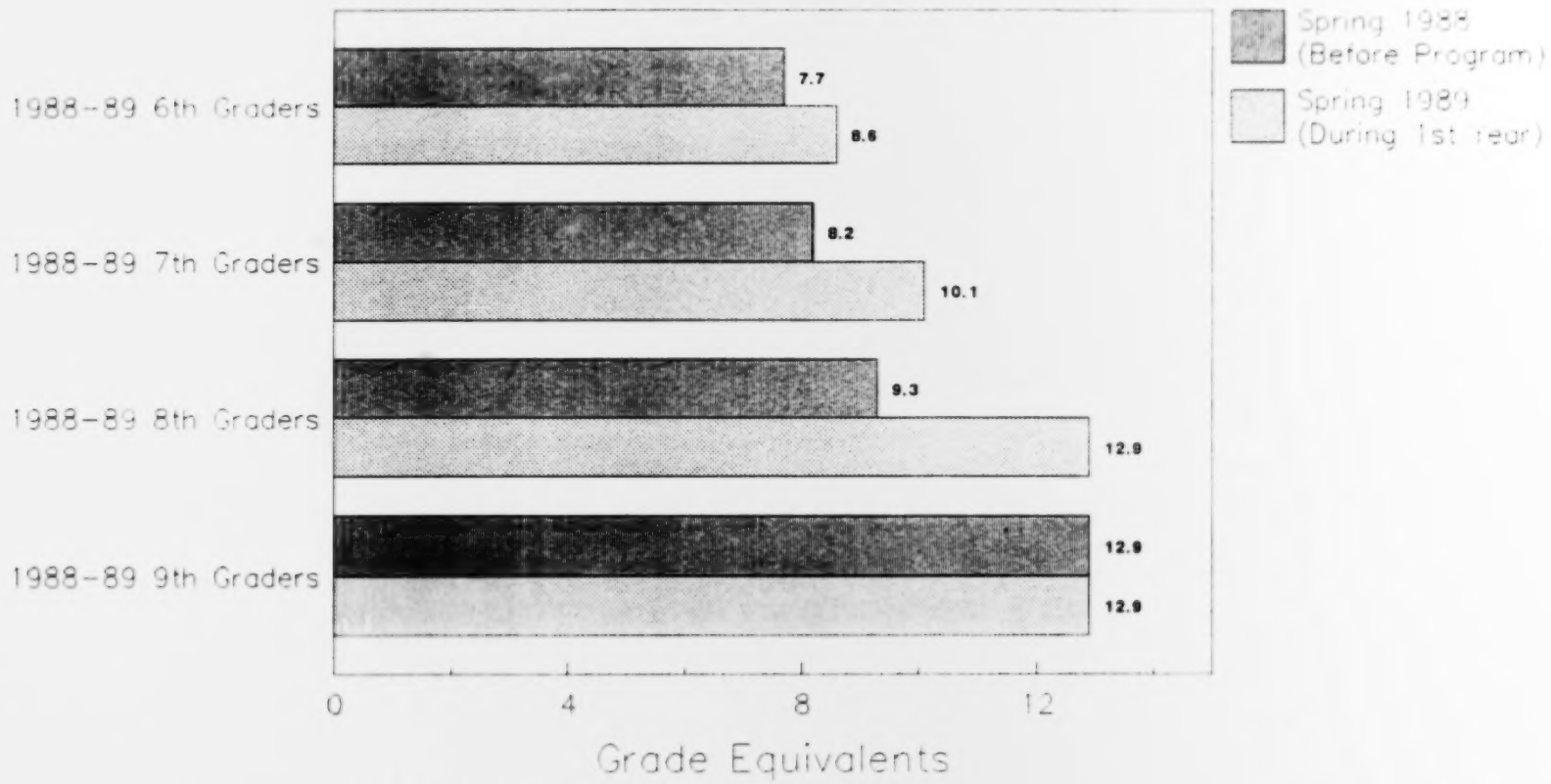
Figure 9. CAT Mathematics Scores of MSEN Pre-College Participants Who Entered the Program During the 1987-88 School Year: 1987-1989 Scores



Number of Students = 49(7th); 98(8th); 81(9th)

8/18/89

Figure 10. CAT Mathematics Scores of MSEN Pre-College Participants Who Entered the Program During the 1988-89 School Year: 1988-1989 Scores



Number of Students = 107(6th); 103(7th); 150(8th); 19(9th)

Figure 11. 1989 CAT Mathematics Scores of MSEN Pre-College Participants Compared With North Carolina Averages: Grades 6 and 8

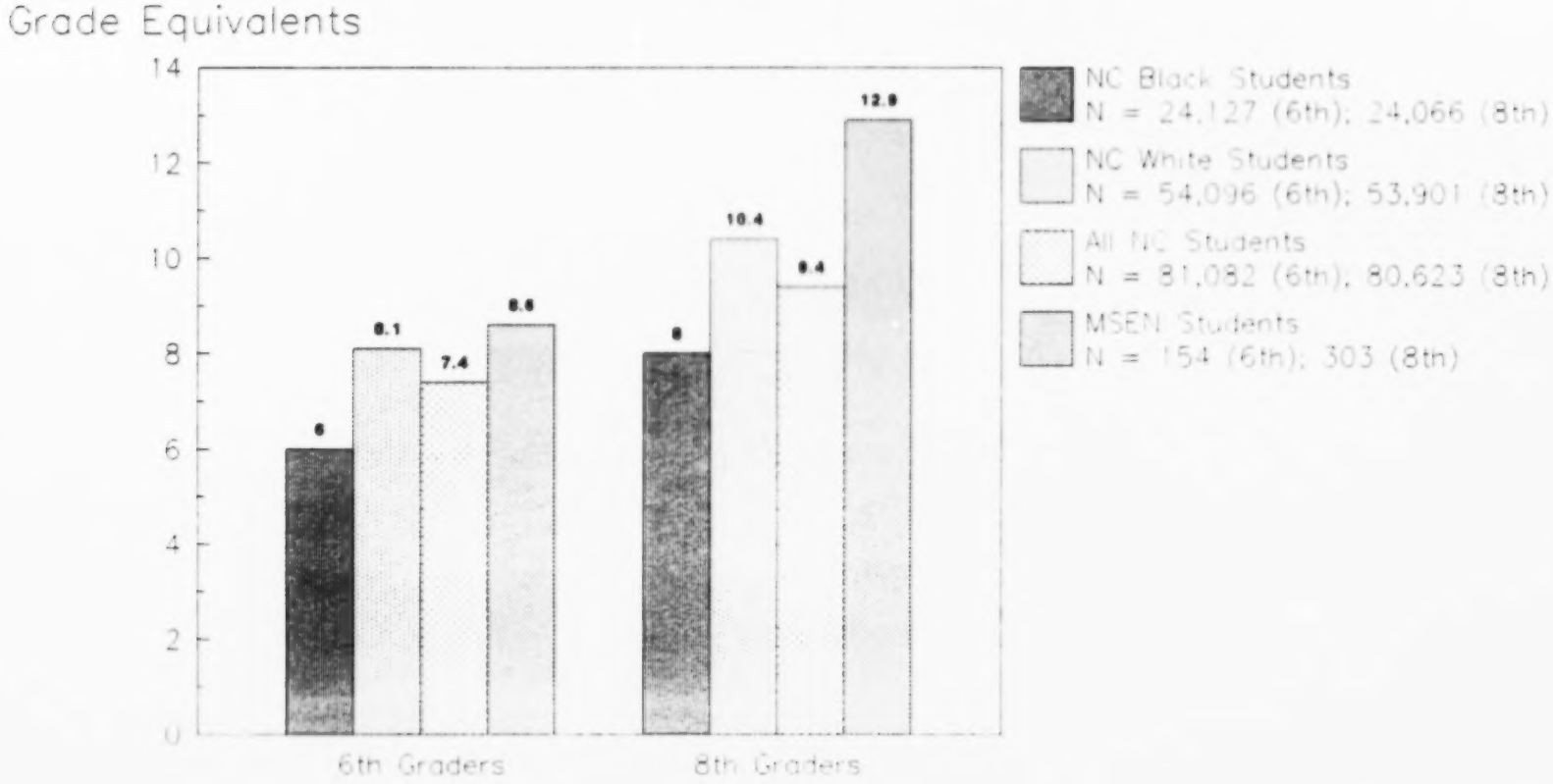
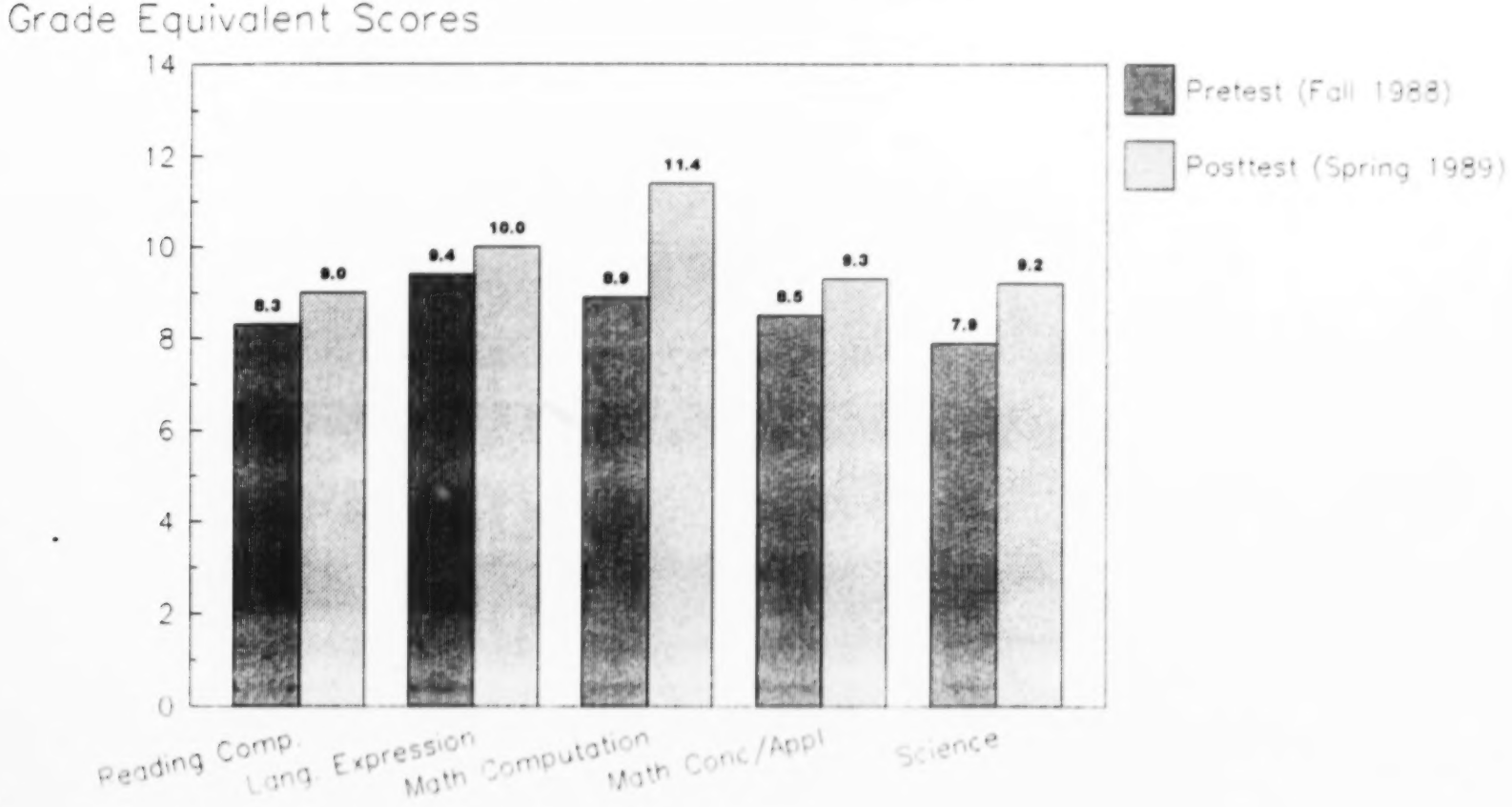


Figure 12. CTBS Pre- and Posttest Scores of North Carolina MSEN Pre-College Program Sixth Graders: 1988-89



Number of Students = 93

8/18/89

Figure 13. CTBS Pre- and Posttest Scores of North Carolina MSEN Pre-College Program Seventh Graders: 1988-89

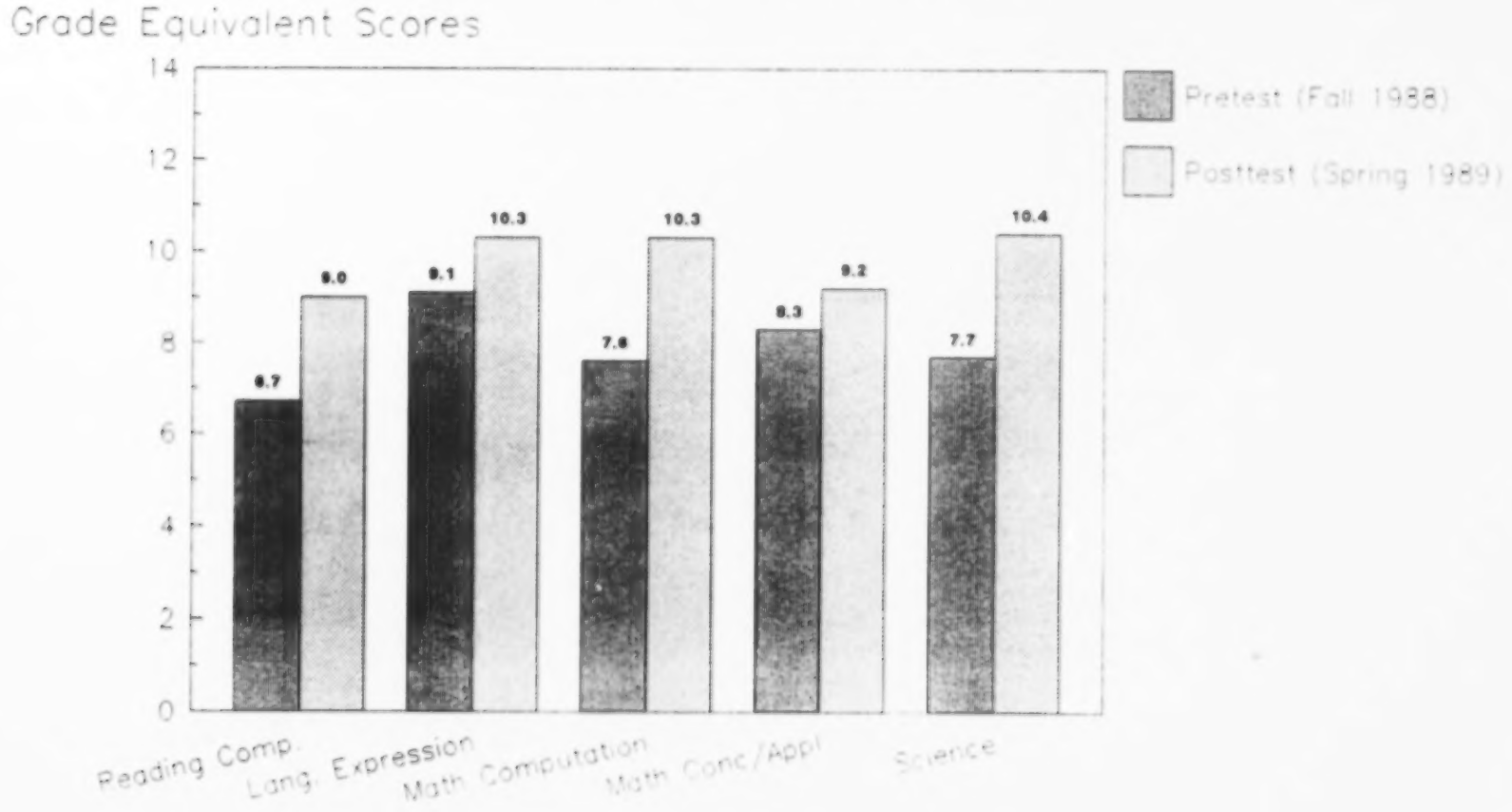
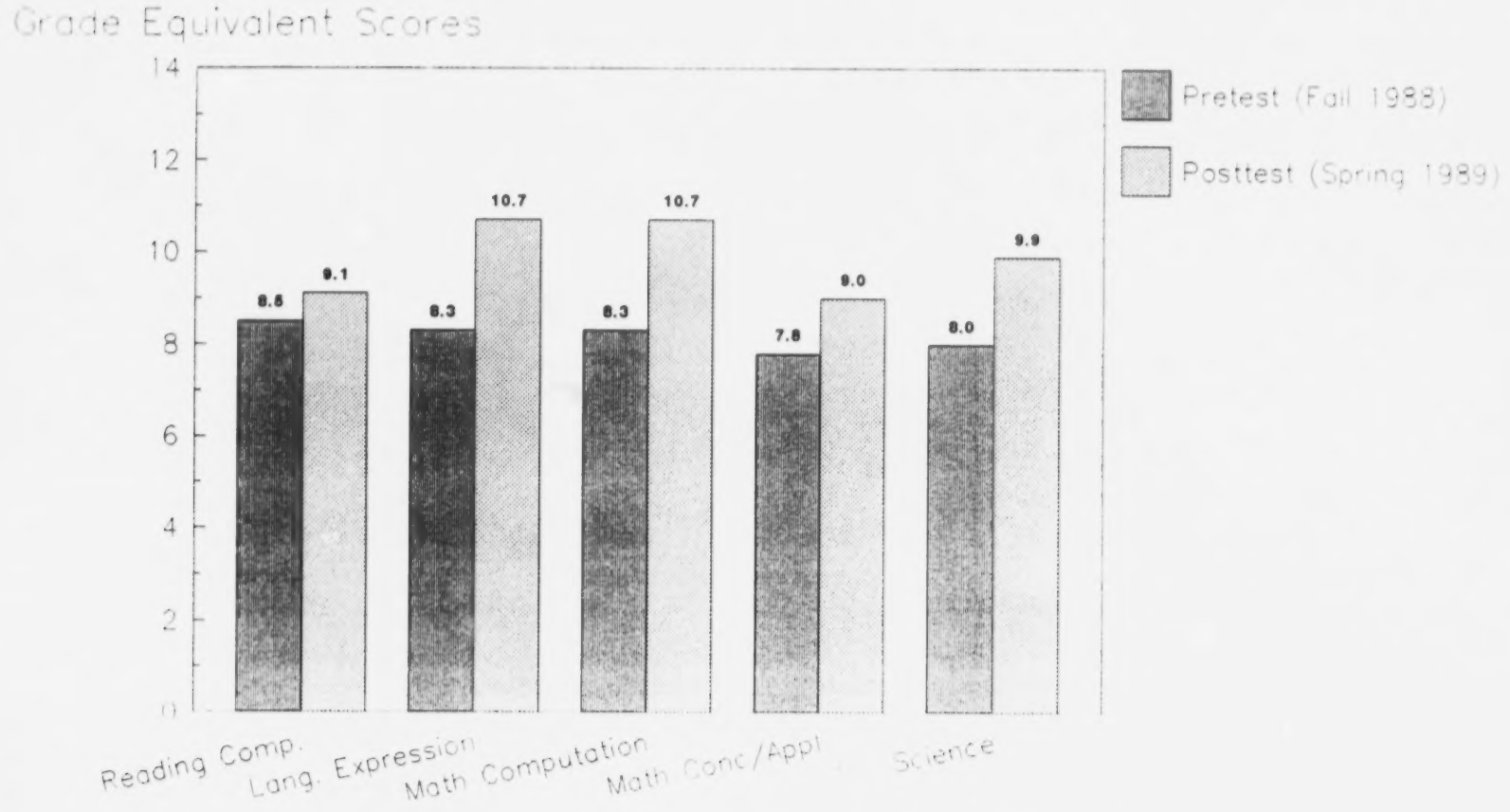
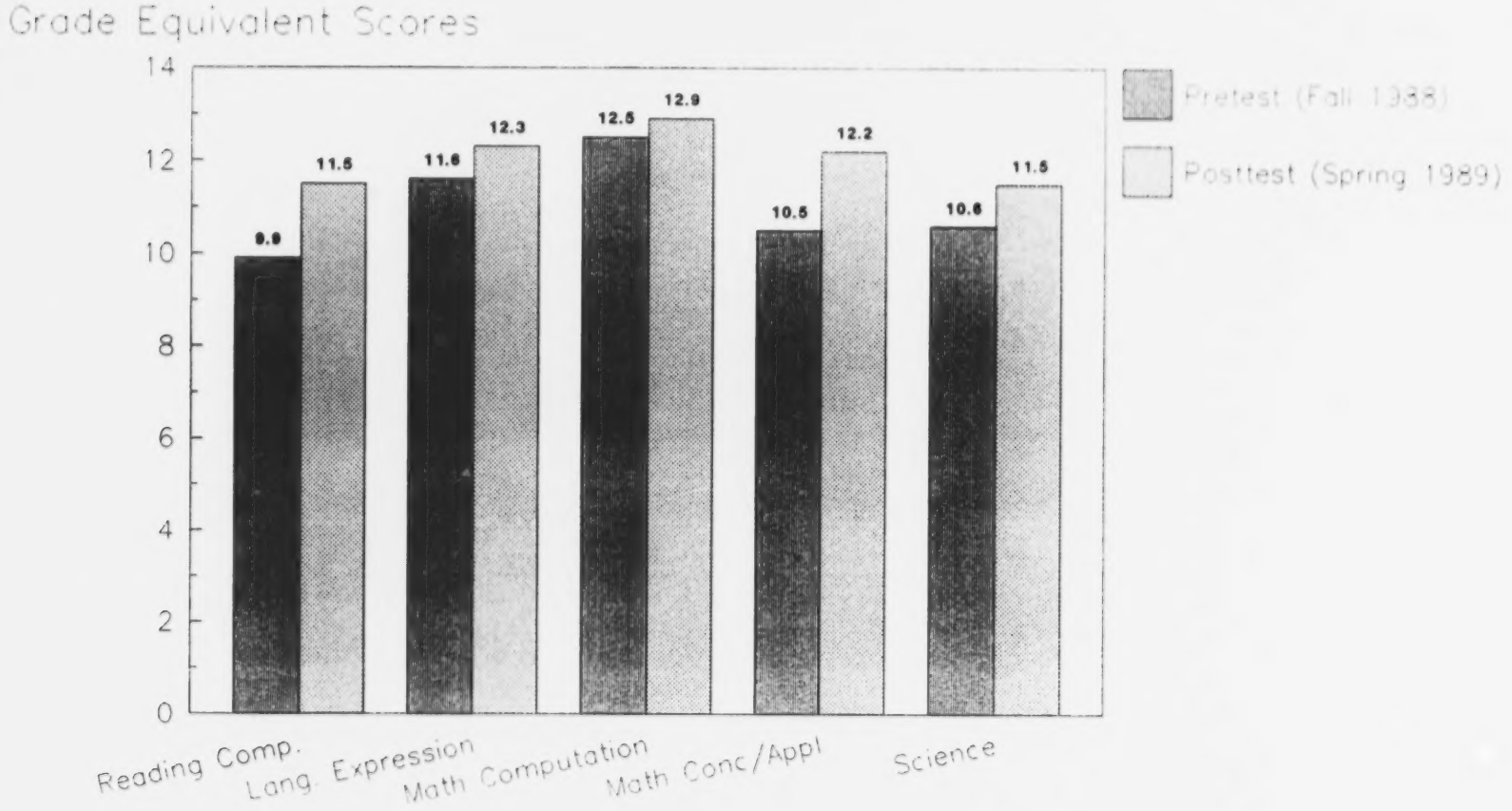


Figure 14. CTBS Pre- and Posttest Scores of North Carolina MSEN Pre-College Program Eighth Graders: 1988-89



Number of Students = 180

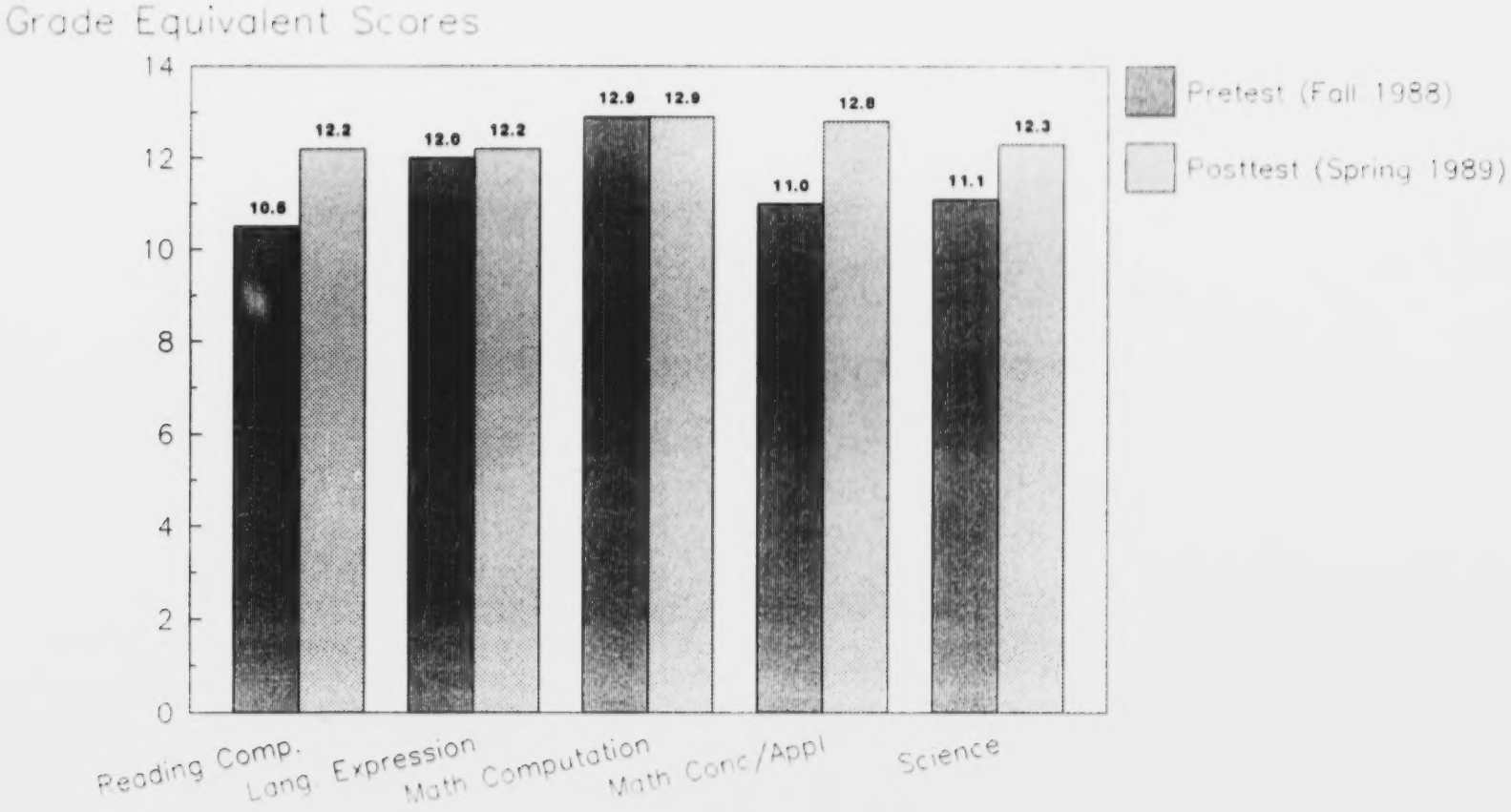
Figure 15. CTBS Pre- and Posttest Scores of North Carolina MSEN Pre-College Program Ninth Graders: 1988-89



Number of Students = 81

8/18/89

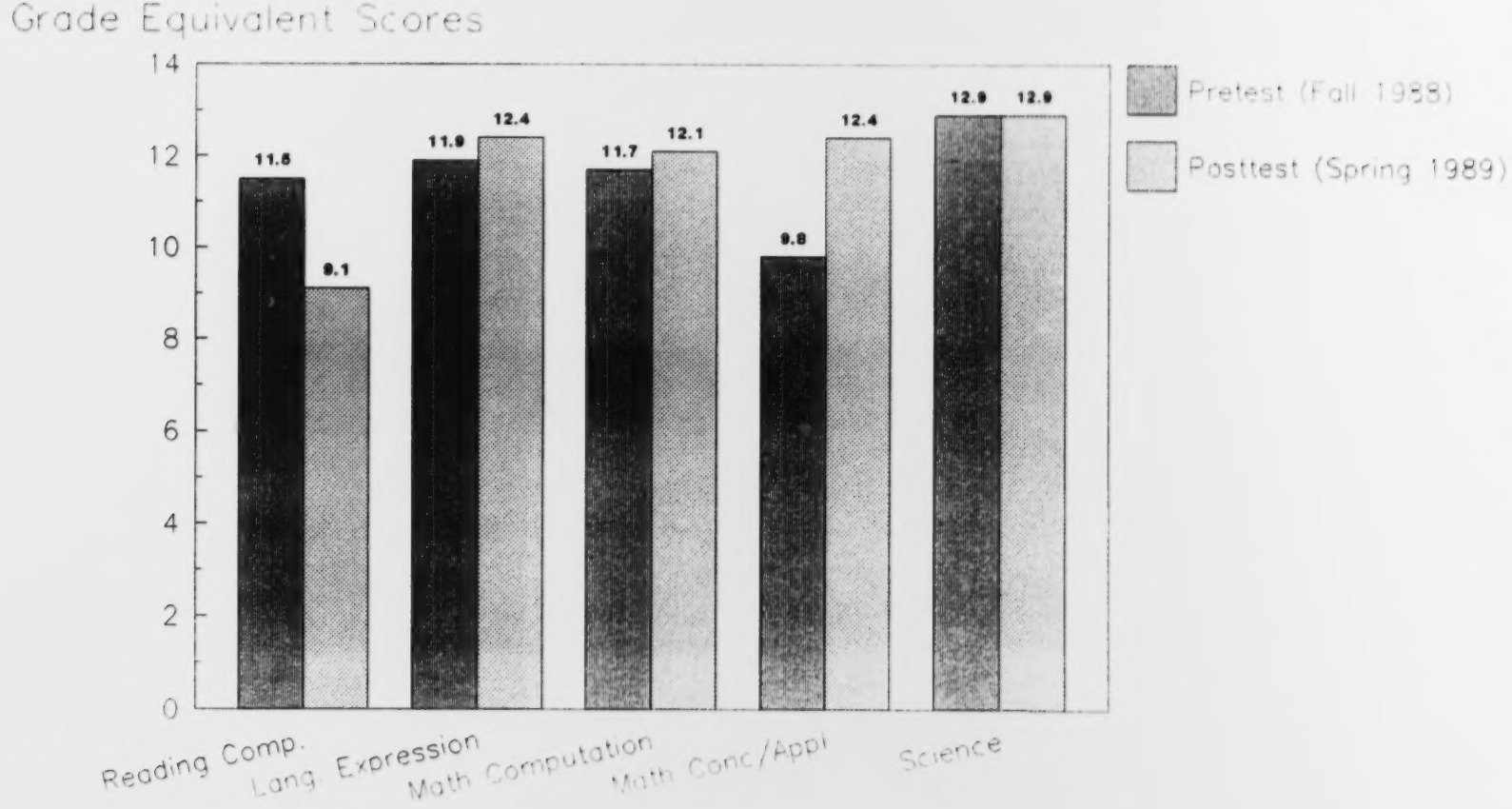
Figure 16. CTBS Pre- and Posttest Scores of North Carolina MSEN Pre-College Program Tenth Graders: 1988-89



Number of Students = 43

8/18/89

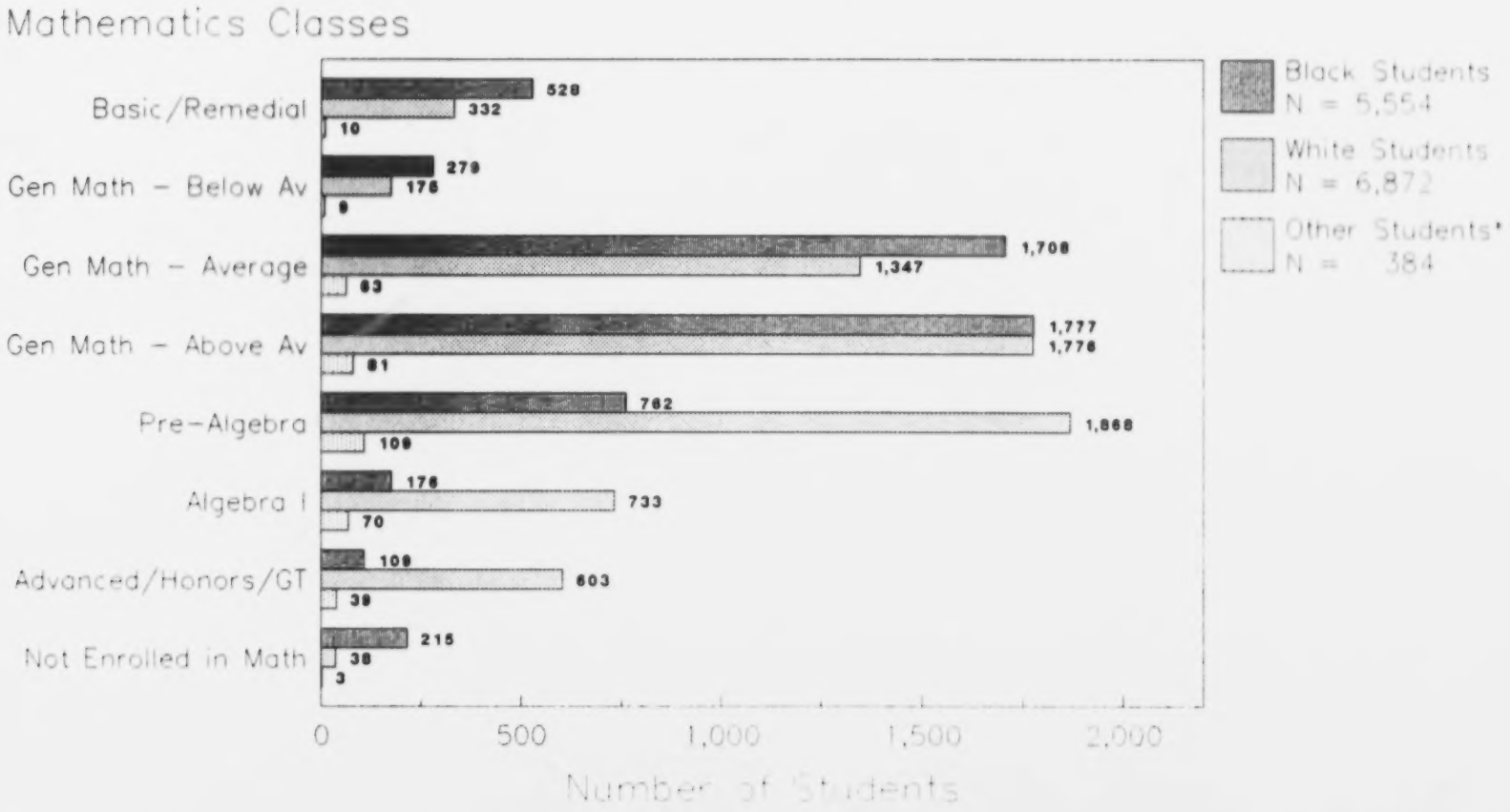
Figure 17. CTBS Pre- and Posttest Scores of North Carolina MSEN Pre-College Program Eleventh Graders: 1988-89



Number of Students = 6

8/18/89

FIGURE 18. MATHEMATICS CLASS ENROLLMENT: 1988-89
Grades 6-8 - Total Enrollment by Race/Ethnicity in MSEN Pre-College Program Schools (N)

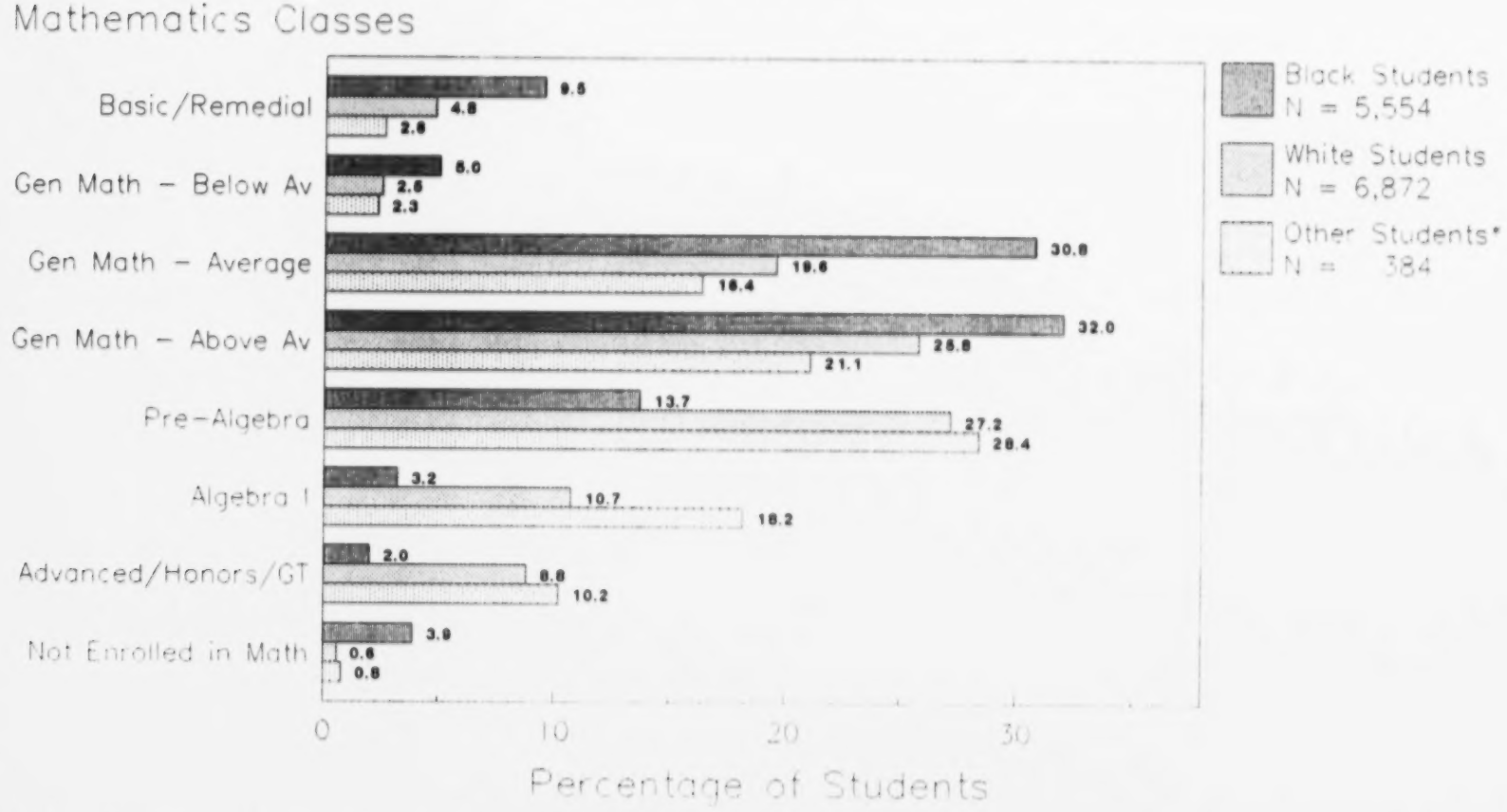


Bars represent the number of students of each race enrolled in each class.

5/19/89

* 37 Amer Indian, 49 Hispanic, & 276 Asian/Other

FIGURE 19. MATHEMATICS CLASS ENROLLMENT: 1988–89
Grades 6–8 – Total Enrollment by Race/Ethnicity in MSEN Pre-College Program Schools (%)

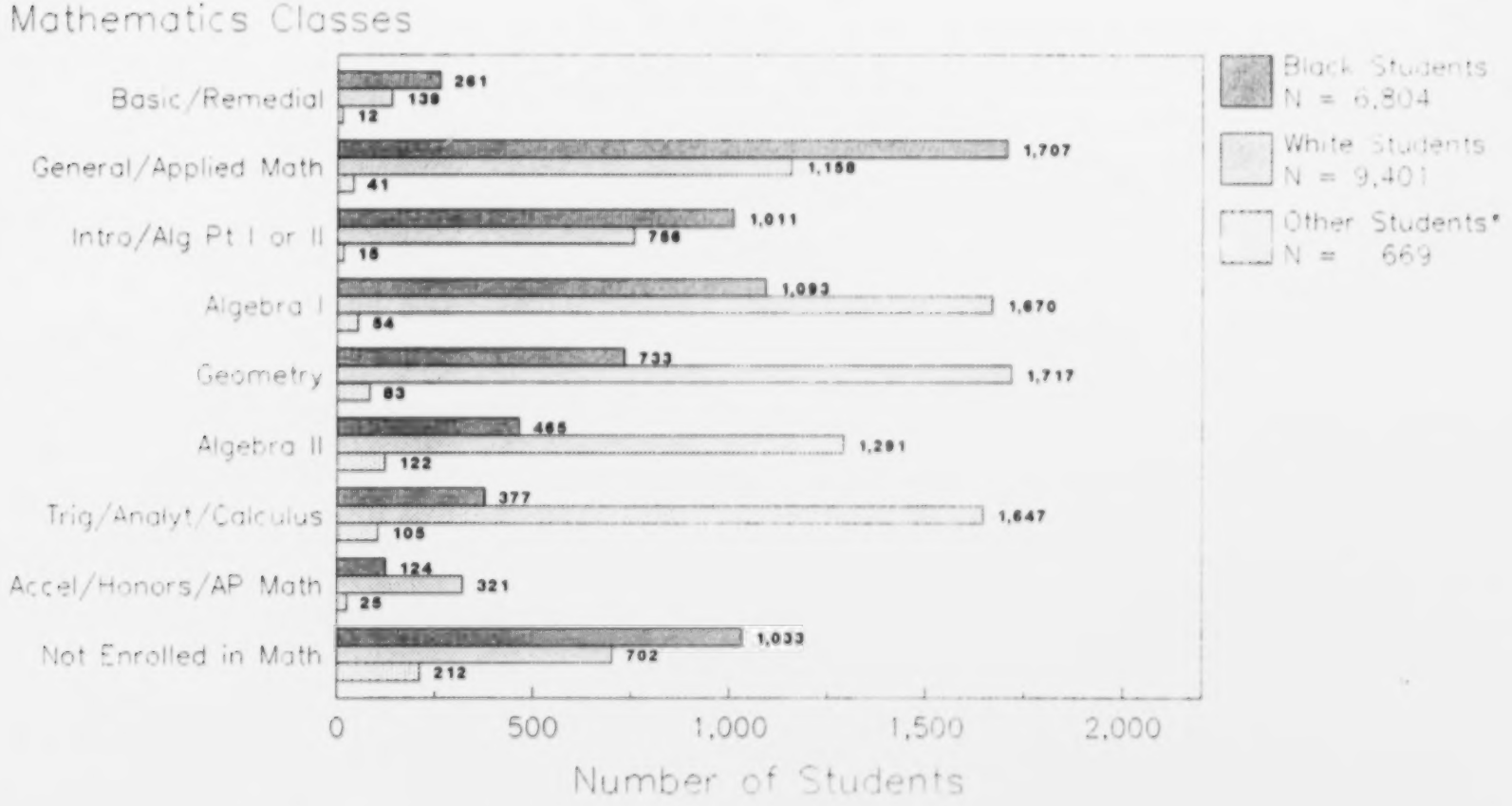


Bars represent the percentage of students of each race as distributed across math classes.

5/19/89

* 37 Amer Indian, 49 Hispanic, & 276 Asian/Other

FIGURE 20. MATHEMATICS CLASS ENROLLMENT: 1988-89
Grades 9-12 - Total Enrollment by Race/Ethnicity in MSEN Pre-College Program Schools (N)

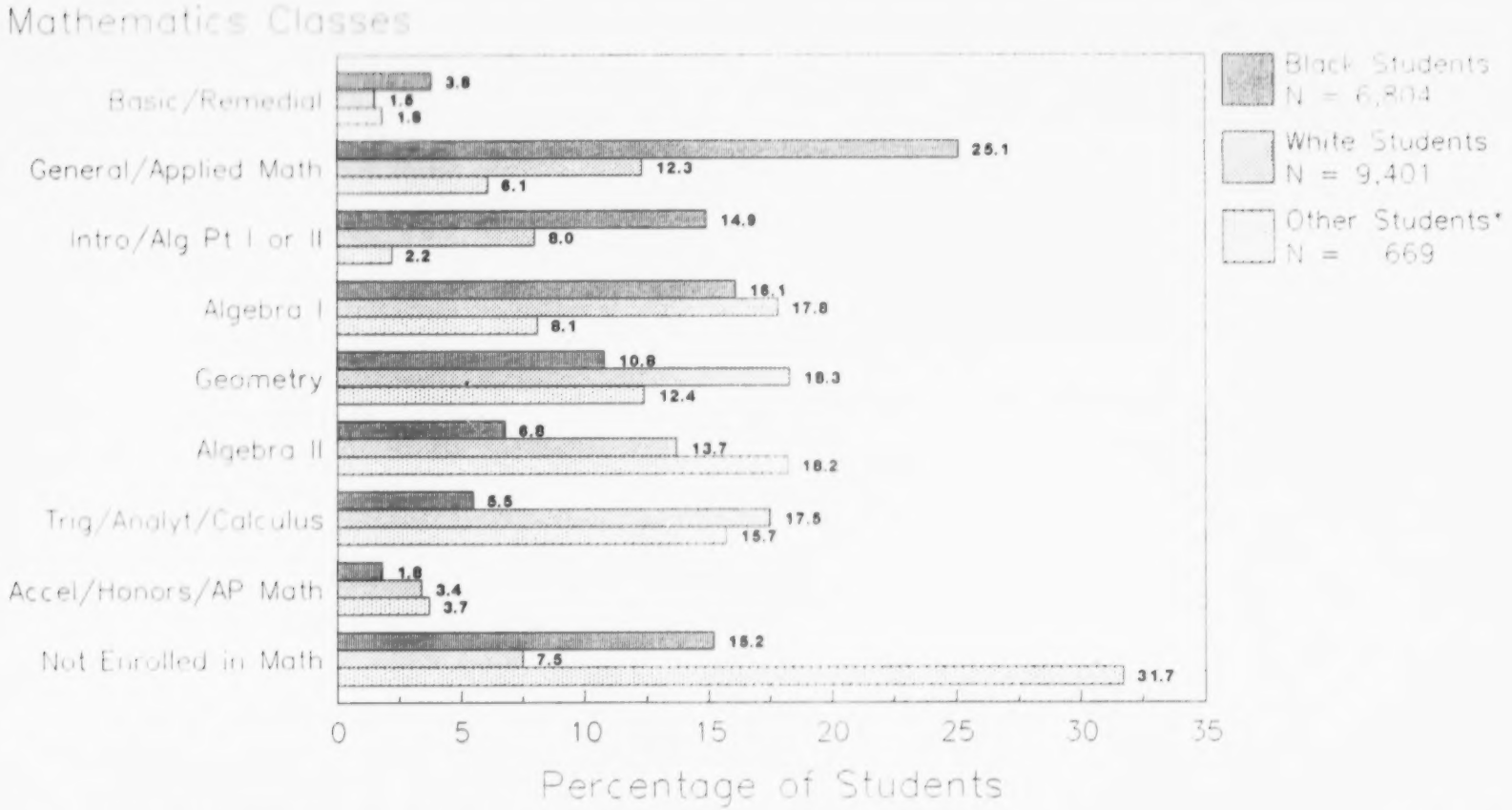


Bars represent the number of students of each race enrolled in each class.

5/19/89

*41 Amer Indian, 296 Hispanic, & 332 Asian/Other

FIGURE 21. MATHEMATICS CLASS ENROLLMENT: 1988-89
Grades 9-12 - Total Enrollment by Race/Ethnicity in MSEN Pre-College Program Schools (%)

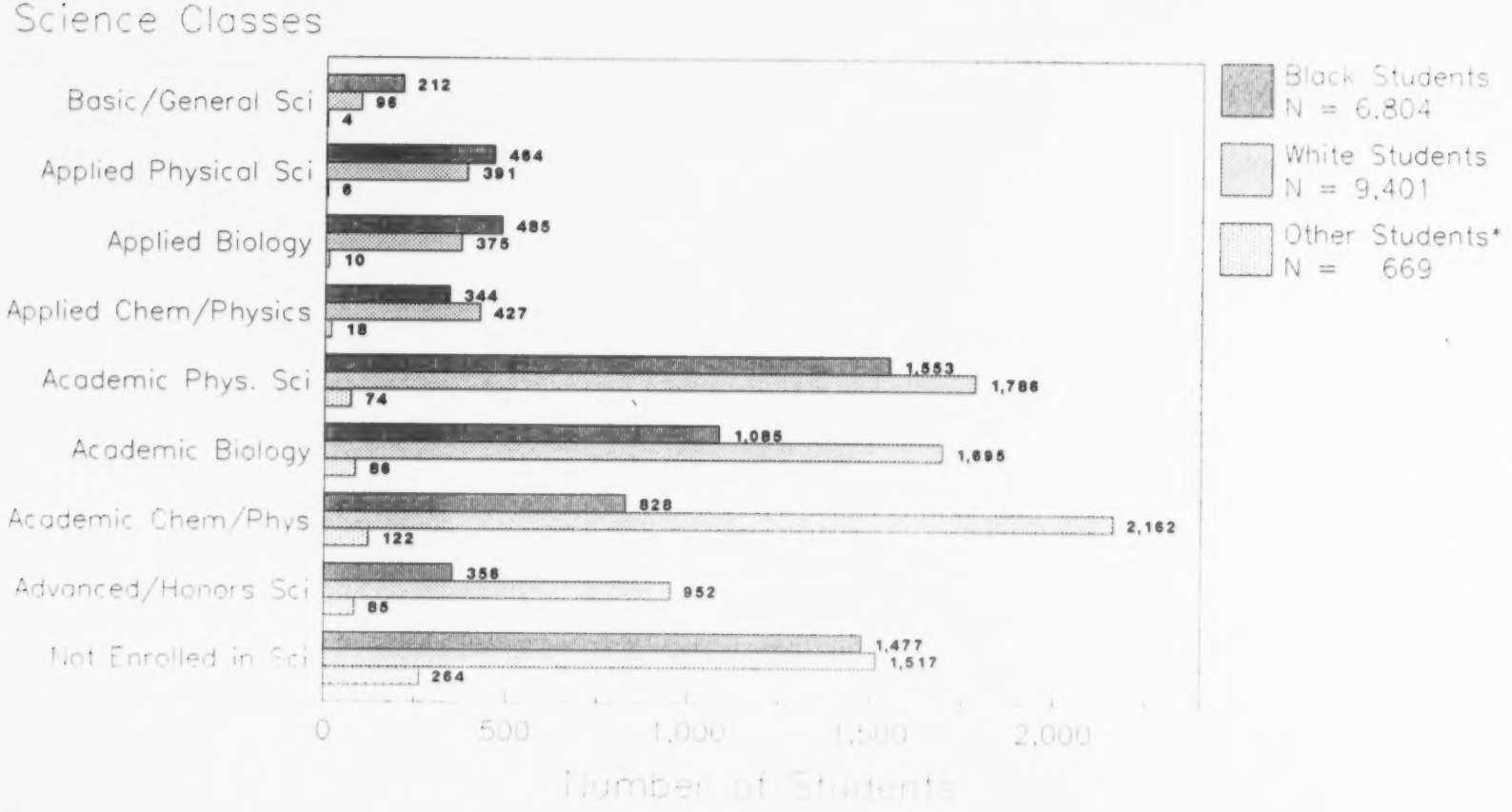


Bars represent the percentage of students of each race as distributed across math classes.

5/19/89

*41 Amer Indian, 296 Hispanic, & 332 Asian/Other

FIGURE 22. SCIENCE CLASS ENROLLMENT: 1988-89
Grades 9-12 - Total Enrollment by Race/Ethnicity in MSEN Pre-College Program Schools (N)

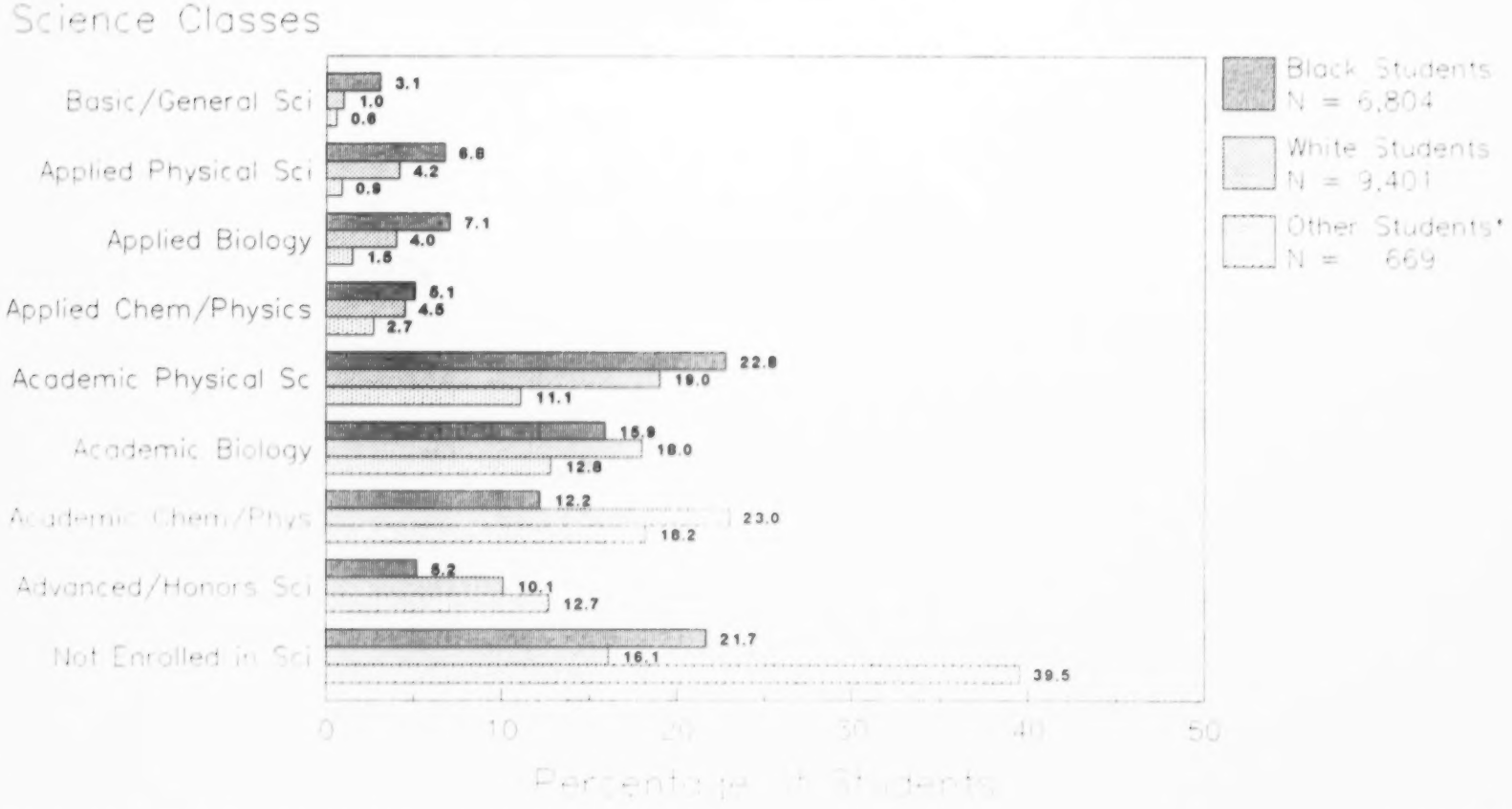


Bars represent the number of students of each race enrolled in each class.

*141 Amer Indian, 296 Hispanic, & 332 Asian/Other

5/19/89

FIGURE 23. SCIENCE CLASS ENROLLMENT: 1988-89
Grades 9-12 - Total Enrollment by Race/Ethnicity in MSEN Pre-College Program Schools (%)



Bars represent the percentage of students of each race as distributed across science classes.

*'91 Amer. Indian, 2.9% Hispanic, & 3.5% Asian / Other

APPENDIX

SUPPLEMENTARY PROGRAM INFORMATION

MSEN PRE-COLLEGE

AEC CURRICULA COMMITTEE MEMBERS AND CO-AUTHORS

(in alphabetical order)

VERNA L. ALLEN	Associate Director, Statewide Office, MSEN Pre-College Programs, UNC-Chapel Hill, NC
ELBERTA J. BELLINGER	Teacher, Cochrane Junior High School; Charlotte, NC
KAY W. BOYD	Teacher, GAMSEC Center; Greensboro, NC
JOSIE A. BULLARD	Teacher, Lowe's Grove Middle School; Durham, NC
ELSIE L. COLE	Teacher, Elizabeth City Junior High School; Elizabeth City, NC
SHERRY COLE	University Testing Center Director, North Carolina Central University; Durham, NC
CAROLYN M. COLLIER	Assistant Coordinator for MSEN Saturday Academy & Summer Scholars Program at North Carolina State University, Raleigh, NC
BONNIE P. HORD	Teacher, China Grove Junior High School; China Grove, NC
MARSHA S. KNOX	Teacher, T.W. Andrews High School; High Point, NC
LOIS S. LASSITER	Teacher John A. Holmes High School; Edenton, NC
VALERIA LAWS	Counselor, Chapel Hill High School; Chapel Hill, NC
MARIAH LOVE	Teacher, Holton Middle School; Durham, NC
G. BERNARD SHAW	Teacher, Griffin Middle School; High Point, NC
MARY P. WOMBLE	Teacher, Holton Middle School; Durham, NC

UNIVERSITY OF NORTH CAROLINA SYSTEMWIDE
MATHEMATICS AND SCIENCE EDUCATION NETWORK
MSEN PRE-COLLEGE PROGRAM

SUMMARY CHART
(Projected)

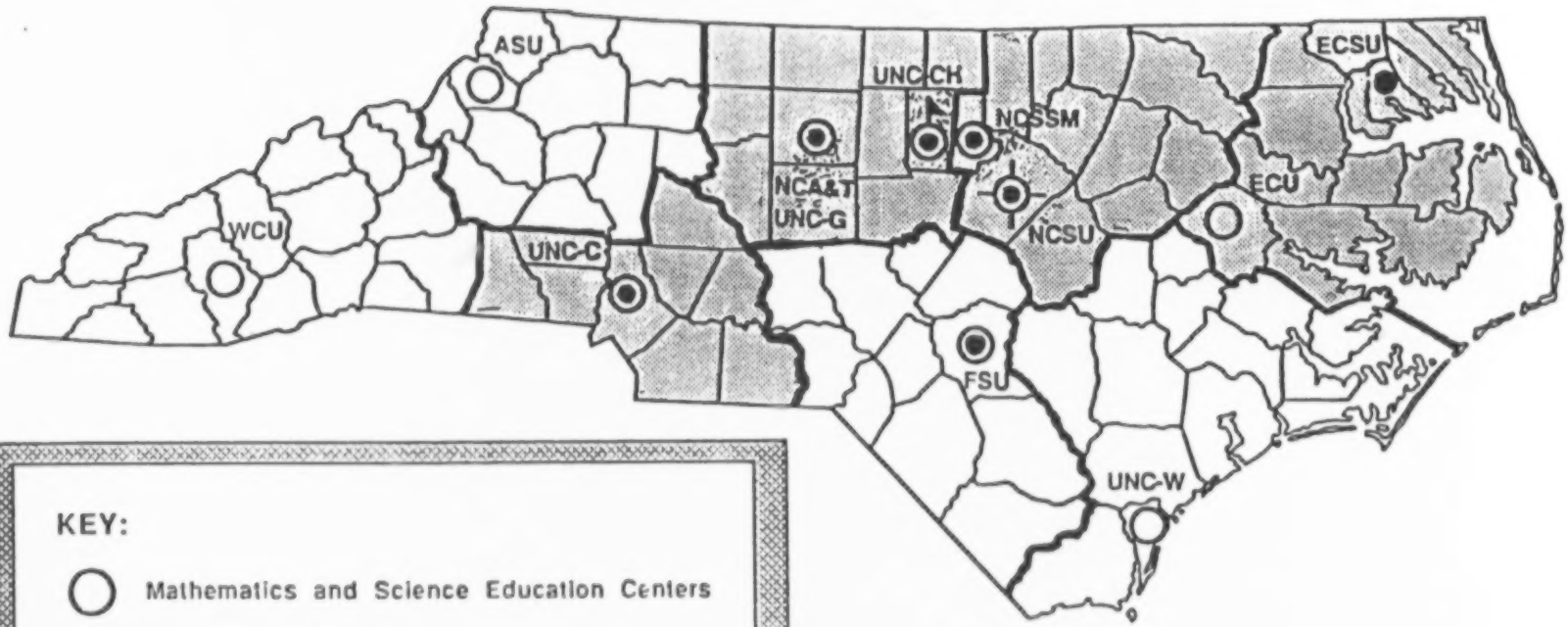
	86/87	87/88	88/89*	89/90	90/91**	91/92	92/93	93/94	94/95
# of Schools:	20	21	39	48	84	84	92	92	92
# of Students:	427	707	1,330	1,848	2,748	2,836	3,012	3,100	3,188
# of Centers:	4	4	5	6	10	10	10	10	10
MSEN Cost per Student:	$960	$650	$521	$794	$527	$451	$424	$412	$401
# of Graduates:	0	0	13	50	115	244	264	284	509
# of Teachers:	53	64	92	116	195	195	216	216	216
# of Teacher Training Sessions:	6/Year	6/Year	8/Year	8/Year	8/Year	8/Year	8/Year	8/Year	8/Year
# of Parents:	214	456	665	924	1,374	1,418	1,506	1,550	1,594
# of Parent Workshops:	2/Center	4/Center	6/Center	8/Center	8/Center	8/Center	8/Center	8/Center	8/Center
MSEN Funding:	$410,000	$459,500	$692,997	$1,467,752	$1,448,251	$1,278,000	$1,278,000	$1,278,000	$1,278,000

NOTE:
The 86/87, 87/88 and 88/89 figures are actual; figures for succeeding years are projected.
*Addition of High Schools, 9-12.
**Addition of 4 new Centers (6 J.H.S. and 3 H.S. per/Center)

(8/89)

MATHEMATICS AND SCIENCE EDUCATION NETWORK

THE UNIVERSITY OF NORTH CAROLINA



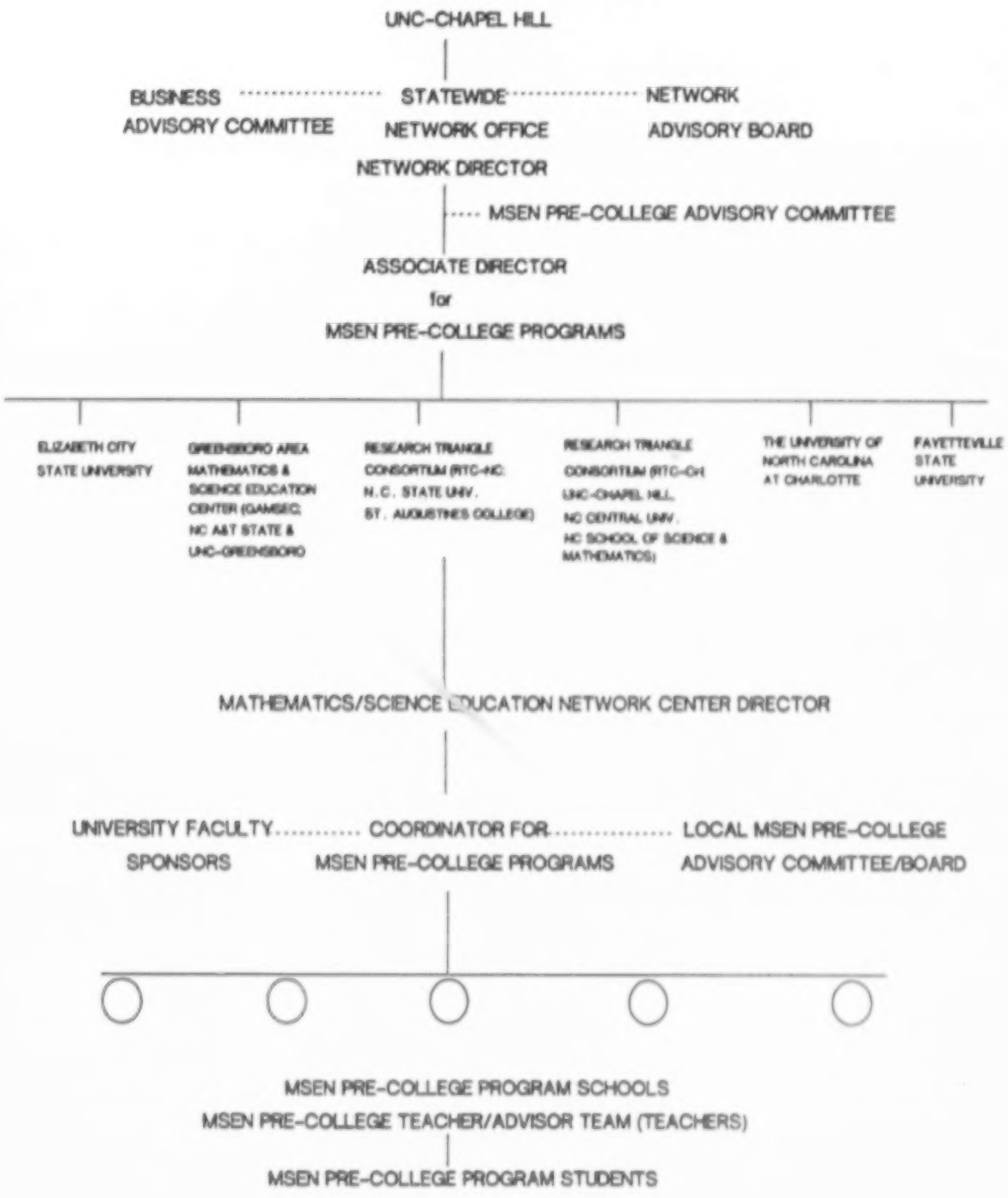
KEY:

- Mathematics and Science Education Centers
- Pre-College Program Sites
- Research and Development Unit, NCSU
- Network Headquarters, UNC-CH
- Pre-College Program Areas

Mathematics and Science Education Network

MSEN PRE-COLLEGE PROGRAM

ORGANIZATIONAL CHART


UNC-CHAPEL HILL
BUSINESS ADVISORY COMMITTEE
STATEWIDE NETWORK OFFICE
NETWORK ADVISORY BOARD
NETWORK DIRECTOR
MSEN PRE-COLLEGE ADVISORY COMMITTEE
ASSOCIATE DIRECTOR for MSEN PRE-COLLEGE PROGRAMS
ELIZABETH CITY STATE UNIVERSITY
GREENSBORO AREA MATHEMATICS & SCIENCE EDUCATION CENTER (GAMSEC: NC A&T STATE & UNC-GREENSBORO
RESEARCH TRIANGLE CONSORTIUM (RTC-HC: N.C. STATE UNIV. ST. AUGUSTINES COLLEGE)
RESEARCH TRIANGLE CONSORTIUM (RTC-CH UNC-CHAPEL HILL NC CENTRAL UNIV. NC SCHOOL OF SCIENCE & MATHEMATICS)
THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
FAYETTEVILLE STATE UNIVERSITY
MATHEMATICS/SCIENCE EDUCATION NETWORK CENTER DIRECTOR
UNIVERSITY FACULTY SPONSORS
COORDINATOR FOR MSEN PRE-COLLEGE PROGRAMS
LOCAL MSEN PRE-COLLEGE ADVISORY COMMITTEE/BOARD
MSEN PRE-COLLEGE PROGRAM SCHOOLS
MSEN PRE-COLLEGE TEACHER/ADVISOR TEAM (TEACHERS)
MSEN PRE-COLLEGE PROGRAM STUDENTS

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DIRECTORY OF MSEN PRE-COLLEGE PROGRAM
COORDINATORS & FACULTY SPONSORS
(Six Program Centers)

MSEN PRE-COLLEGE CENTERS	MSEN PRE-COLLEGE PROGRAM COORDINATORS/FACULTY/ SPONSORS/CENTER DIRECTORS	ADDRESS
NETWORK HEADQUARTERS (Statewide Office) University of North Carolina at Chapel Hill	Dr. William H. Graves Mathematics and Science Education Network Interim Director (919) 966-3256	Mathematics and Science Education Network UNC-Chapel Hill CB #3345, 201 Peabody Hall Chapel Hill, NC 27599-3345
	Ms. Verna Allen Associate Director MSEN Pre-College Programs (919) 966-3256	Mathematics and Science Education Network CB #3345, 201 Peabody Hall Chapel Hill, NC 27599-3345
1. RESEARCH TRIANGLE CONSORTIUM at NC State	Dr. Sarah Berenson MSEN Center Director (919) 737-2013	Center for Research in Mathematics and Science Education NC State University 315 Poe, Box 7801 Raleigh, NC 27695-7801
	Ms. Carolyn Collier Assistant Coordinator MSEN Pre-College Program (919) 737-2013	Center for Research in Mathematics and Science Education NC State University 315 Poe, Box 7801 Raleigh, NC 27695-7801
	Dr. Larry Clark Lead Faculty Sponsor (919) 737-3148	Associate Provost NC State University P. O. Box 7101 Raleigh, NC 27695
2. RESEARCH TRIANGLE CONSORTIUM at UNC-Chapel Hill	Dr. Russell Rowlett MSEN Center Director (919) 966-5922	Mathematics and Science Education Center UNC-Chapel Hill CB #3500, 309 Peabody Hall Chapel Hill, NC 27599
	Ms. Deborah Evans Coordinator, RTC-CH MSEN Pre-College Program (919) 966-3256	Mathematics & Science Education Center UNC-Chapel Hill CB# 3500 309 Peabody Hall Chapel Hill, NC 27599

	Dr. Harold Wallace Faculty Sponsor (919) 962-6962	Vice Chancellor/ University Affairs UNC Chapel Hill 103 S. Bldg.005A/CB #9100 Chapel Hill, NC 27599
	Dr. JoAnn Barber Faculty Sponsor (919) 286-3366, Ext. 664	Assistant Principal NC School of Science and Mathematics P.O. Box 2418 Durham, NC 27705
	Dr. Lafayette Lipscomb Faculty Sponsor (919) 560-6230	Associate Vice Chancellor for Academic Affairs NC Central University Durham, NC 27707
	Dr. Mickey Burnim Faculty Sponsor (919) 560-6230	Vice Chancellor for Academic Affairs NC Central University Durham, NC 27707
3. GREENSBORO AREA MATHEMATICS AND SCIENCE EDUCATION CENTER (GAMSEC)	Dr. Vallie Guthrie MSEN Center Director (919) 334-7938	217 Marteena Hall NC A & T State University Greensboro, NC 27411
	Ms. Sarah Hamilton Coordinator, GAMSEC MSEN Pre-College Program (919) 334-7808	233 Marteena Hall NC A & T State University Greensboro, NC 27411
	Ms. Clara Ross Assistant Coordinator MSEN Pre-College Program (919) 334-7808	233 Marteena Hall NC A & T State University Greensboro, NC 27411
	Dr. Elvira Williams Lead Faculty Sponsor	Professor of Physics Department of Physics NC A & T State University Greensboro, NC 27411
	Dr. Reginald Whitsett Faculty Sponsor	Professor of Industrial Engineering NC A & T State University Greensboro, NC 27411

4. UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE (UNC-C)	Dr. Gail Gibson MSEN Center Director (704)547-4838 547-4543	Mathematics and Science Education Center UNC-Charlotte Kennedy Hall, Rm 303 Charlotte, NC 28223
	Ms. Jean Worsley Assistant Coordinator MSEN Pre-College Program (704) 547-4857	Mathematics and Science Education Center UNC-Charlotte Kennedy Hall, Rm 303 Charlotte, NC 28223
	Dr. Kim Prichard Faculty Sponsor (704) 547-4565	Department of Mathematics UNC-Charlotte Barnard Building Charlotte, NC 28223
5. ELIZABETH CITY STATE UNIVERSITY (ECSU)	Ms. Alta Perry Coordinator MSEN Pre-College Program 919 (335-3409)	Elizabeth City State Univ. P.O. Box 718 Elizabeth City, NC 27909
	Ms. Mattie Perry Weeks Assistant Coordinator MSEN Pre-College Program	Elizabeth City State Univ. P. O. Box 718 Elizabeth City, NC 27909
	Dr. Georgia Lawrence Faculty Sponsor Professor of Mathematics (919) 335-3458	Division of Mathematics Elizabeth City State Univ. Elizabeth City, NC 27909
	Dr. Helen Caldwell Interim Vice Chancellor for Academic Affairs	Elizabeth City State Univ. P.O. Box 718 Elizabeth City, NC 27909
6. FAYETTEVILLE STATE UNIVERSITY (FSU)	Dr. Leo Edwards MSEN Center Director (919) 486-1669	Mathematics/Science Education Center Fayetteville State Univ. Fayetteville, NC 28301

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